Maritime Heritage Minnesota

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Lake Minnetonka Nautical Archaeology 4 Project Report





Correct Craft Utility Wreck
21-HE-467

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Acknowledgments

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Cover: The Correct Craft Utility Wreck (21-HE-467) by Kelly Nehowig. Insert: Correct Craft Utility dashboard and steering wheel (by Mark Slick).



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Introduction

Shipwrecks and the artifacts associated with them tell a story. Removing or otherwise disturbing artifacts, treating them as commodities that can be sold, obliterates that story. Nautical archaeological and maritime sites are finite and are significant submerged cultural resources. Nautical, maritime, underwater, maritime terrestrial – MHM deals with all of these types of sites throughout the State of Minnesota. Maritime Heritage Minnesota's (MHM) mission is to document, conserve, preserve, and when necessary, excavate these finite cultural resources where the welfare of the artifact is paramount. MHM is concerned with protecting our underwater and maritime sites – our shared Maritime History – for their own benefit in order for all Minnesotans to gain the knowledge that can be obtained through their study. MHM's study of wrecks does not include the removal of artifacts or damaging the sites in any way. MHM does not raise wrecks or 'hunt' for 'treasure'. Submerged archaeological sites in Minnesota are subject to the same State statues as terrestrial sites: the Minnesota Field Archaeology Act (1963), Minnesota Historic Sites Act (1965), the Minnesota Historic District Act (1971), and the Minnesota Private Cemeteries Act (1976) if human remains are associated with a submerged site. Further, the case of *State v. Bollenbach* (1954) and the Federal Abandoned Shipwrecks Act of 1987 provide additional jurisdictional considerations when determining State oversight and "ownership" of resources defined by law as archaeological sites (Marken, Ollendorf, Nunnally, and Anfinson 1997, 3-4). Therefore, just like terrestrial archaeologists working for the State or with contract firms, underwater archaeologists are required to have the necessary education, appropriate credentials, and hold valid licenses from the Office of the State Archaeologist (OSA).

MHM completed two side and down-imaging sonar surveys of Lake Minnetonka in September-November 2011 and May-June 2012 – the Lake Minnetonka Surveys 1 and 2 Projects (LMS-1, LMS-2). Prior to MHM's two comprehensive surveys, there was one recognized nautical archaeological site on the lake bottom and another five wrecks were known. MHM completed the Lake Minnetonka Nautical Archaeology 1-3 Projects (LMNA-1, LMNA-2, LMNA-3) between 2012-2014. At the beginning of the Lake Minnetonka Nautical Archeology 4 Project (LMNA-4) in early June 2015, there were 36 known wrecks (including the Lake Minnetonka North Arm Dugout Canoe removed from the lake in 1934) and 11 other sites/cultural resources identified on the bottom of Lake Minnetonka.

Preface

During the Lake Minnetonka Nautical Archaeology 4 Project (LMNA-4), MHM investigated 58 anomalies, 5 known wrecks that MHM had not yet dove upon (to conducted condition assessments), and on 4 wrecks and 1 maritime site already dove upon (to gather additional information about them). The fieldwork was conducted from early June to late August 2015.

Results of the Lake Minnetonka Nautical Archaeology 4 Project

Research Design

The purpose of the LMNA-4 Project was to determine the nature of specific anomalies, re-visit particular known wrecks sites to answer questions about certain attributes of those resources, and to continue MHM's sediment build-up study. MHM determined which anomalies would be investigated from an analysis of sonar data that suggested they were submerged cultural resources. The 59 anomalies examined during the LMNA-4 Project were: 5, 13, 27, 42, 62, 70, 78.2, 90.1, 110, 121.1, 126.1, 127.1, 127.4, 128, 129, 146, 171, 184, 185, 203, 220, 247, 269, 288, 289, 291, 291.1, 350, 359, 411, 414, 418, 423, 455, 458, 463, 464, 466, 467, 468, 474, 477, 478, 485, 490, 496, 500, 501, 503, 509, 511, 514, 519, 528, 529, 541, 542, 544, 545. Using data accumulated from the fieldwork as a starting point, MHM conducted research to place newly recognized nautical archaeological sites and anomalies in their historical contexts. Minnesota Archaeological Site Forms were filed with the OSA when appropriate.

Methodology

The methodology used to identify and rudimentarily document underwater archaeological anomalies is straightforward. MHM used the GPS coordinates of a wreck or anomaly to drop a weighted diver down buoy near the target. Then the dive boat anchored a short distance away from the buoy and divers geared up for the dive. At any given time, there were between two and four divers underwater. If the buoy anchor weight landed near and sometimes on the anomaly or wreck, no search for the target was conducted. However, for a variety of reasons, a brief search for the target was conducted until it was located or it was determined that the anomaly was a false sonar return. If a cultural resource was located, the divers photographed and recorded video of the site, recorded its basic measurements, examined any obvious attributes, and measured sediment build-up (if appropriate), data that would be used to assist with site disposition dates.

Results

After the completion of the LMNA-4 Project fieldwork in August 2015, there are now 43 identified wrecks on the bottom of Lake Minnetonka or that were once on the bottom, including a Woodland Culture dugout canoe removed from the lake in 1934. Of these wrecks, 27 of them have 26 Minnesota archaeological site numbers; 2 wrecks are

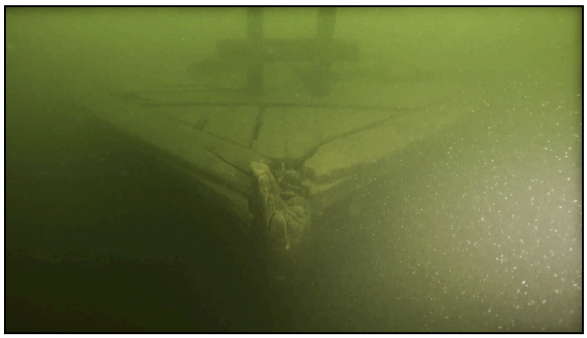
features of one site. The precise sinking dates or the year of disposition of 12 of the 16 remaining wrecks are known; MHM will fill out site forms for them when appropriate. Further, 3 other types of maritime sites now have archaeological site numbers and there are 11 maritime sites without numbers. Additionally, other objects have been identified that do not have site numbers: 3 cars, 1 truck, 1 snowmobile, and 10 'other' objects. During the LMNA-4 Project specifically – of the 59 anomalies investigated – MHM and the volunteers confirmed the existence of 7 new wrecks, 7 new submerged maritime sites, 1 truck, 1 snowmobile, 8 other objects, 4 trees, 4 large rocks, and 25 were false sonar returns comprised of unusual bottom contours or vegetation. Further, MHM gathered new information on the Wayzata Bay Wreck (21-HE-401), *Saucy Kate* Wreck (21-HE-420), *George/Excelsior* Wreck (21-HE-399), *Como* Wreck (21-HE-397), *Hopkins/Minnetonka* Wreck (21-HE-396), *Hercules* Wreck (21-HE-398), St. Albans Bay Wreck (21-HE-400), *Priscilla* Wreck (21-HE-404), and the Marine Launch Boilers Site (21-HE-421). The data gathered during these new investigations on known wrecks and the boilers site advanced our understanding of those sites, their maritime history, and of them were included in the sediment study.

Update: Wayzata Bay Wreck (21-HE-401)

MHM identified the Wayzata Bay Wreck as a wooden model barge in May 2013. The wreck is a rare and well-preserved model barge that is 85.00 feet long, is 18.50 feet in the beam, has a 3.50 foot depth of hold, and there is 16 inches of silt built-up in the hold. A model barge is an un-powered vessel that has two pointed (sharp) ends, making her double-ended. She is sturdily built, with distinct scarfs in her gunwale at different points, has an intact deck, substantial wooden cleats, deck hatches, large H-bitts on both ends, and distinct stem/stern posts. The Wayzata Bay Wreck sank on September 30, 1879: "Monday night's storm was a lively on at Lake Minnetonka. A barge was sunk and a small steamer was capsized near Wayzata" and "the storm last night proved a regular screamer at Lake Minnetonka. The wind held high frolic, and succeeded in tipping over a small steamer anchored near the Wayzata shore, and sinking a barge". The Wayzata Bay Wreck was part of the barge fleet owned by the fuel company of Hill & Acker, and was constructed in 1876. This model barge was utilized to haul cord wood and ties from Upper and Lower Lake Minnetonka communities to Wayzata. The cord wood was then transferred to railroad cars for delivery to sites where it could be utilized as steam locomotive fuel. Wood ties were loaded on the rail cars for delivery to railroad extension sites. The deforestation of Lake Minnetonka increased available agricultural land and building construction sites. The Wayzata Bay Wreck represents a one-of-a-kind nautical archaeological site in Minnesota, one of only three model barge wrecks in the United States, and the best-preserved wreck of her type known (Merriman and Olson 2015, 18; *Minneapolis Tribune* 1879; Saltus and Stewart-Abernathy 2002, 102-118; Stewart-Abernathy 2002, 172-174; Stewart-Abernathy and Saltus 2002, 139, 141; *St. Paul Globe* 1879). MHM submitted a site form update to the OSA in July 2015.



A sonar image of the Wayzata Bay Wreck (MHM).



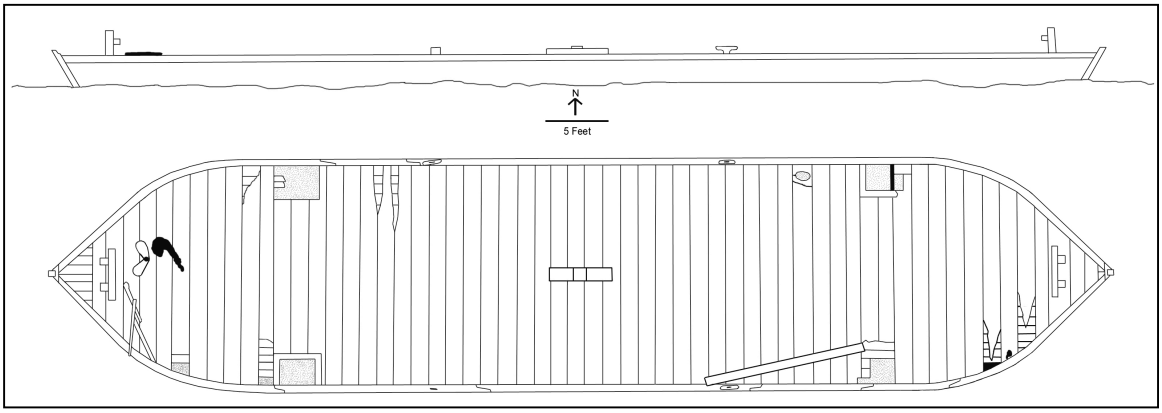
The bow of the Wayzata Bay Wreck (Mark Slick).



A scarf in the gunwale of the Wayzata Bay Wreck (Mark Slick).



The model barge *James R. Young* moored at James J. Hill's St. Paul Levee warehouse on the Mississippi River (MNHS MR2.9SP3r7, digitized by MHM).



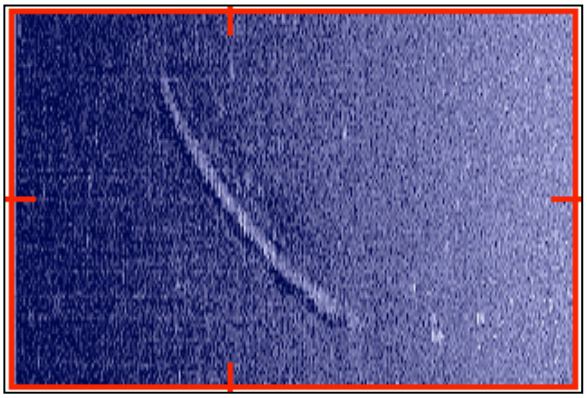
A site plan sketch and profile of the Wayzata Bay Wreck (Christopher Olson).

Update: *Saucy Kate* Wreck (21-HE-420)

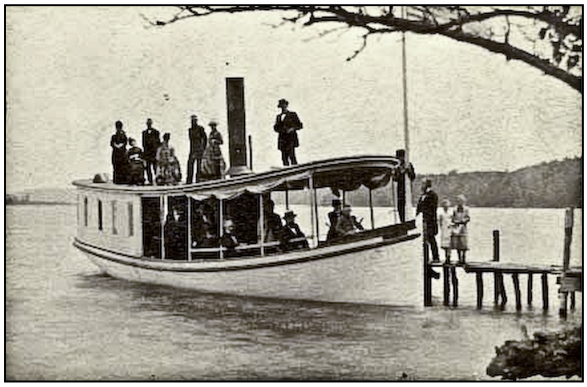
Propeller steamer *Saucy Kate* was constructed from the remains of 45-foot *Kate/Katie May*, a steamboat owned by Captain Charles May. *Katie May* sank in Robinsons Bay when her boiler exploded on June 23, 1877, killing three of the five men on board. The *Katie May* was raised later that summer. Apparently her builder Maurice Godfrey incorporated the engine and sections of *Kate/Katie May's* bow and stern into the new *Saucy Kate* and she was launched in mid-June 1878. Throughout the 1880s, *Saucy Kate* provided transportation to thousands of Lake Minnetonka tourists and residents. In the 1890 season, *Saucy Kate* was the first steamer to announce regular lake packet service beginning on May 25, meeting the Great Northern Railway train at Minnetonka Beach on Lafayette Bay and again meeting the train in Spring Park on the Upper Lake later in the day, providing passengers with a lake excursion or point-to-point transportation, whichever was desired. For the next few years, *Saucy Kate* reliably carried passengers on scheduled routes and on special occasions from the Upper to Lower Lake. *Saucy Kate* had a long working life on Lake Minnetonka, finally being sold to Captain John R. Johnson on July 24, 1897. On September 8, 1899, *Saucy Kate* caught fire at Solberg's Point while secured to a barge fashioned from part of the hull of the steamboat *City of St. Louis*. The barge sustained substantial damage but was saved, while *Saucy Kate* could only be towed away from the shore and let to burn. She sank nearby, with only her "smoke stack, the upper part of her engine and boiler and her charred gunwales" visible above the lake surface. The wreck was raised and moved to deeper water since she was a hazard to navigation. Her new location was reported to be in "deep water off Gale Island", but this account was erroneous. *Saucy Kate* was the oldest steamer on Lake Minnetonka at the time of her sinking and had been characterized as "one of the most popular boats on the lake". MHM identified the wreck in 2013. MHM dove on the wreck in mid-July 2015 and while often little sunlight reaches the wreck due to her location in a gully, this visit to the wreck was successful. During this project, the visibility was excellent and MHM thoroughly recorded the site with video and photos. This better look at the wreck indicates the extent of the wreck's burning, but also how much of the vessel survived. Of particular note are the survival of futtocks, longitudinal stringers, a number of scarfs, a large cleat, and supports for the large over-hanging rubrail that is suggestive of a sponson. Of particular note is the complete survival of the starboard side bow that extends 10 feet aft, including the intact gunwale, an upper bow rail, her diagnostic stempost, and her rounded stern (Lake Minnetonka Navigation Company 1897; McGinnis 2010, 135; Merriman and Olson 2013b, 11-16). MHM submitted a site form update to the OSA in July 2015.



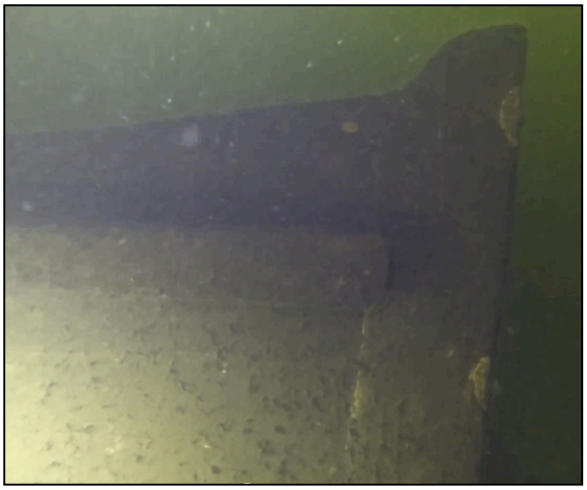
Saucy Kate (MNHS HE5.13p73, digitized by MHM).



A side-scan sonar image of the *Saucy Kate* Wreck (MHM).



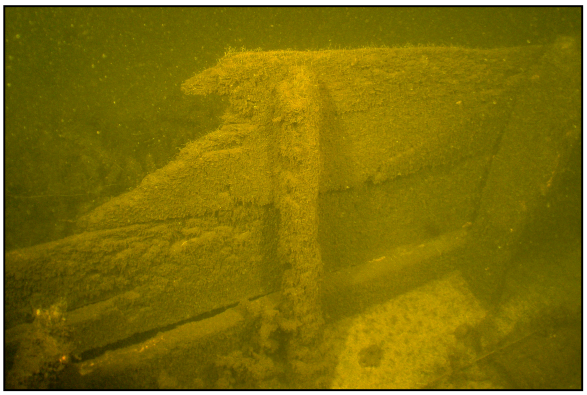
Saucy Kate (MNHS HE5.13r64, digitized by MHM).



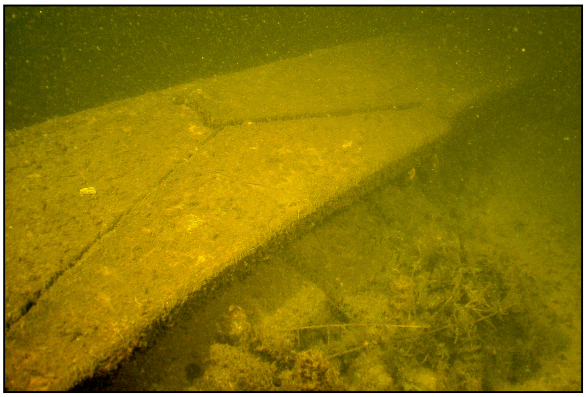
The stempost of *Saucy Kate* (Kelly Nehowig).



A cleat on the gunwale (Kelly Nehowig).



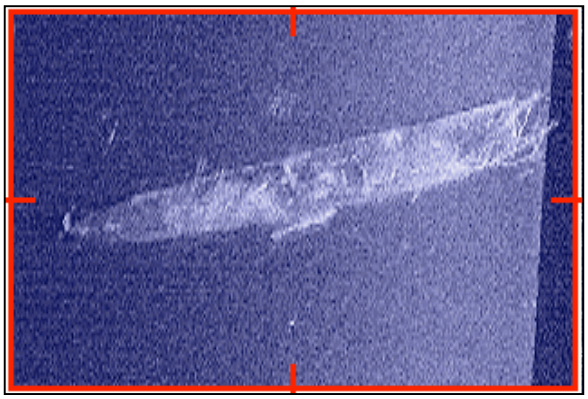
Futtocks attached to the hull strakes; note the charring (by Mark Slick).



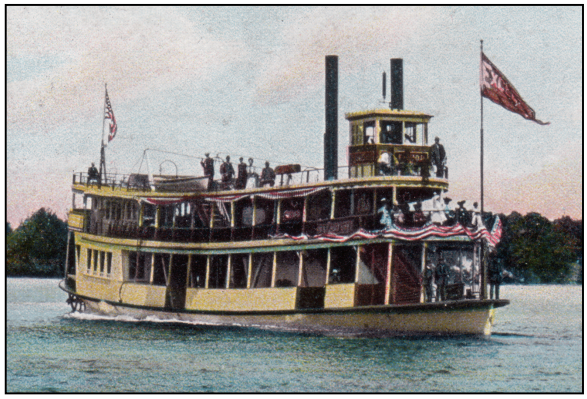
A gunwale scarf (by Mark Slick).

Update: *George/Excelsior* Wreck (21-HE-399)

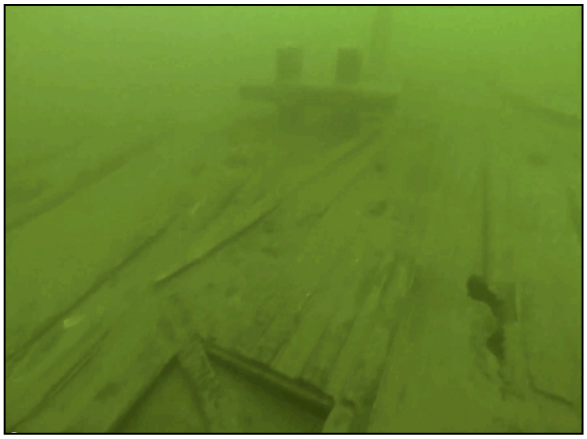
Maurice Godfrey and George Day constructed the sternwheeler *George* in 1901. She measured 125.00 feet long and 22.00 feet in the beam. She was re-designed in 1904 and re-named *Excelsior*. She operated on Lake Minnetonka, becoming one of the Twin City Rapid Transit Company excursion vessels in 1906. She was burned as a spectacle on August 9, 1909, with 5,000 people gathering to watch her demise. *George/Excelsior* was labeled the 'Unknown Stern-wheeler' wreck during the 1997 SHPO-sponsored survey of Lake Minnetonka. The *George/Excelsior* Wreck's deck is partially intact and many of her construction attributes are extant, regardless of her burned condition. On her foredeck, an H-bitt and flagpole are intact, her gunwale survives along the entirety of the wreck, and both her cylinder timbers survive at the stern. There is 36 inches of silt in the hold (Hall, Birk, and Newell 1997, 28, 58; McGinnis 2010, 90; Merriman and Olson 2012a, 29, 2015d; *Minnetonka Record* 1912a). Despite the assertions that zebra mussels could not survive in water below 40 feet, the *George/Excelsior* Wreck is infested with them, in 56 feet of water. MHM submitted a site form update for the *George/Excelsior* Wreck to the OSA in July 2015.



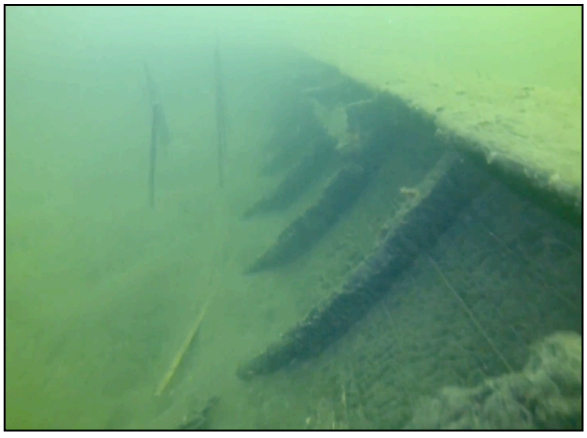
A sonar image of the *George/Excelsior* Wreck (MHM).



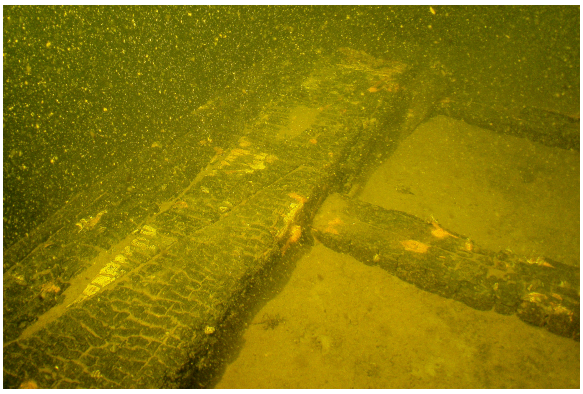
George/Excelsior (MHM Postcard)



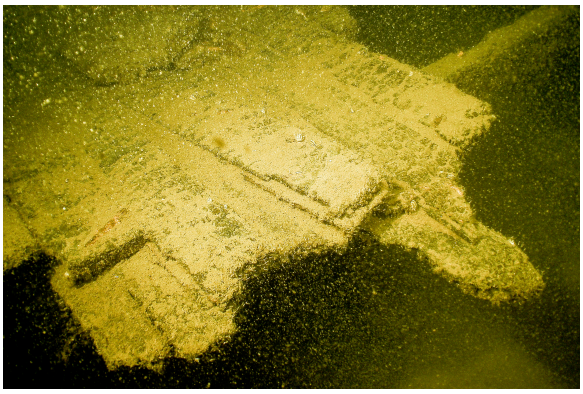
The deck and an H-bitt (Kelly Nehowig).



The burned inner hull with engine mounting rods and futtocks (Kelly Nehowig).



A section of burned gunwale and deck beams (Mark Slick).



Burned timbers (Mark Slick).



The port cylinder timber (by Kelly Nehowig).

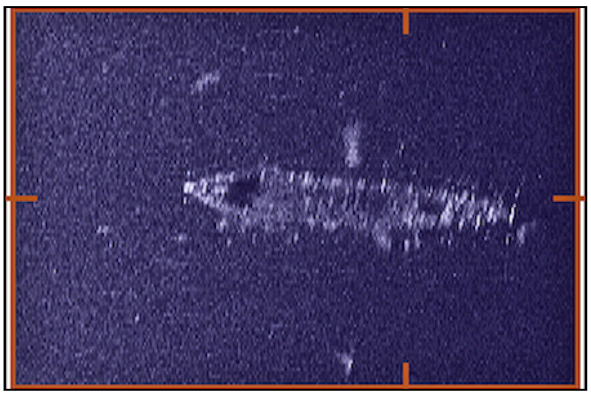


The starboard rudder stock with its tiller attached (by Kelly Nehowig).

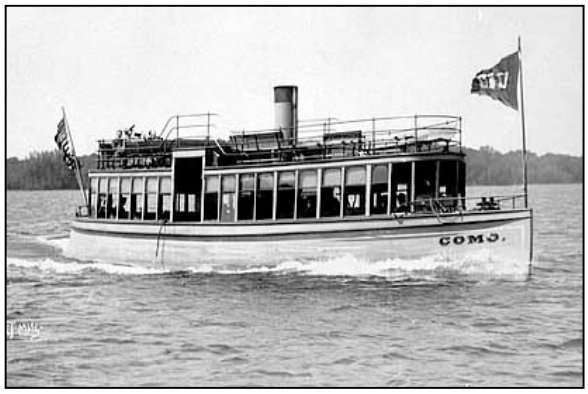
Update: *Como* Wreck (21-HE-397)

The Streetcar Boat *Como* was designed by Royal C. Moore and constructed under his supervision at the Twin City Rapid Transit Company (TCRT) shops in Minneapolis. *Como* measured 70.00 feet long, 14.83 in the beam, and had a 5.00 foot draft. Her hull was constructed of cypress with white oak frames and painted canary yellow like the trolley cars. *Como* carried a 150 horse power triple expansion steam engine, 250 psi water tube boiler, and their propulsion depended on a 46-inch diameter propeller. *Como* were sunk in 1926 after being partially dismantled. Prior to scuttling, her superstructure was removed and her engine, boiler, and seats recycled. (Construction Records: Ledgers, TCRT Records 1926; Merriman and Olson 2012a, 32-27, 2015a; SHPO Records). MHM dove on the *Como* Wreck for the first time during the LMNA-4 Project in mid-June 2015. The wreck is in good condition, with a bitt, deck, railings, gunwale, and other fittings such as the air scoop are intact. Almost all the chocks and all but one clear are missing; MHM is unsure if they were removed prior to sinking or if they were looted; her propeller was illegally removed in the early 1990s and other looting was reported to the Hennepin County Sheriff at that time. The existence of brick debris from

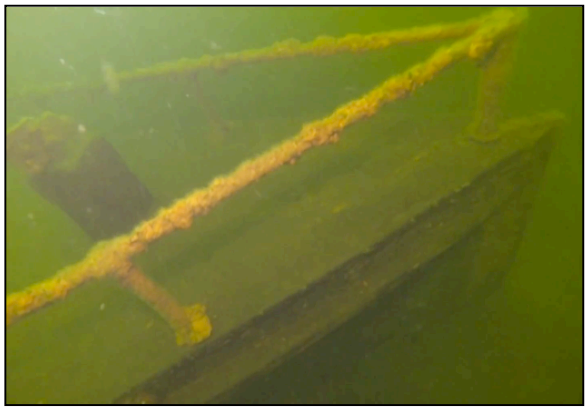
Big Island Amusement Park in the wreck's hold confirms reports that the hull was filled with these items to help weigh her down prior to sinking. The excellent condition of the wood paneling in the passenger area is surprising and '*Como'* can be read on the outer hull, although the letters are very light. There is 42 inches of silt built-up in the hold and as of early June 2015, the wreck is infested with zebra mussels, even in 55 feet of water. MHM submitted a site form update for the *Como* Wreck to the OSA in July 2015.



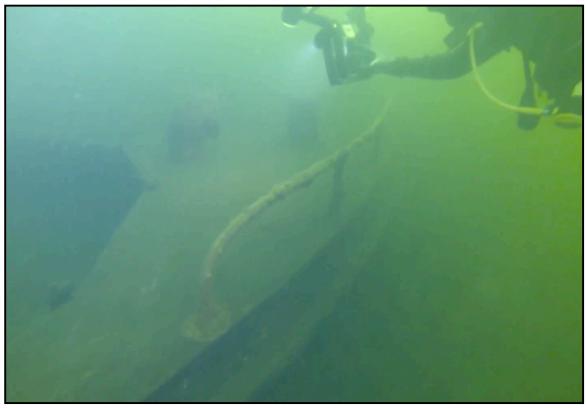
Sonar image of the *Como* Wreck (MHM).



The *Como* (MNHS HE5.13p32, digitized by MHM).



The bow of the *Como* (Kelly Nehowig).



The stern of the *Como* (Kelly Nehowig).



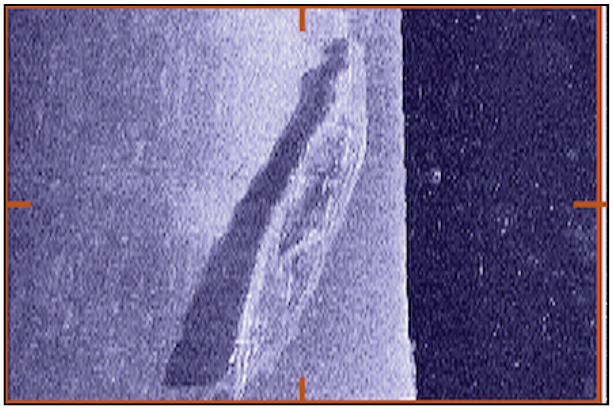
A cleat (Mark Slick).



Bricks in the hull (Mark Slick).

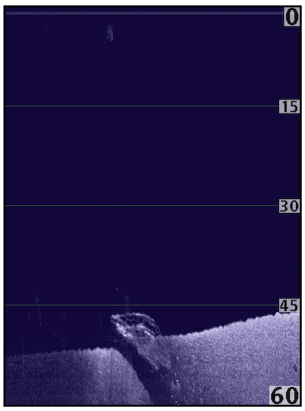
Update: *Hopkins/Minnetonka* Wreck (21-HE-396)

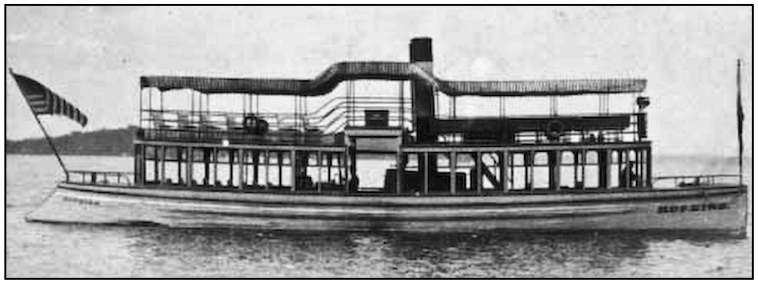
The Streetcar Boat *Hopkins* was designed by Royal C. Moore and constructed under his supervision at the Twin City Rapid Transit Company (TCRT) shops in Minneapolis. *Hopkins* measured 70.00 feet long, 14.83 in the beam, and had a 5.00 foot draft. Her hull was constructed of cypress with white oak frames and painted canary yellow like the trolley cars. *Hopkins* carried a 150 horse power triple expansion steam engine, 250 psi water tube boiler, and their propulsion depended on a 46-inch diameter propeller. *Hopkins* was purchased by Captain George Hopkins and operated on the lake as *Minnetonka* until her scuttling in 1949. Like her sister *Como* (sisters *White Bear* and *Minnehaha* were also scuttled in 1926), *Hopkins/Minnetonka* was stripped of her engine and many fittings, although some of her superstructure remained intact (Construction Records: Ledgers, TCRT Records 1926; Merriman and Olson 2012a, 32-27, 2015a). MHM dove on the *Hopkins/Minnetonka* Wreck for the first time during the LMNA-4 Project in June 2015. The wreck is in good condition, with bollards deck, railings, gunwale, and other fittings intact, as well as part of the superstructure. The smokestack is lying down inside the hull and there is 31 inches of silt build-up in the hull. The metal cleats are missing but the chocks are extant; MHM is unsure if the cleats were removed prior to sinking or if they were looted in the 1990s. The biggest preservation, conservation, and condition issues with the wreck are the instances of 'graffiti' scraped into the side of the hull by sport divers, the placement of a Black and Decker power tool in one of the toilets, and the placement of an old SCUBA dry suit off the starboard forward quarter of the wreck that says "Davy Jones" on it. The treatment of an archaeological site like it is an amusement park should not be tolerated. As of early June 2015, the wreck is infested with zebra mussels and like the other deeper wrecks, this should not be occurring in 45 feet of water. MHM submitted a site form update for the *Hopkins/Minnetonka* Wreck to the OSA in July 2015.



Left: A side-scan sonar image of the *Hopkins/Minnetonka* (MHM).

Right: A sonar down image of the *Hopkins/Minnetonka* (MHM).





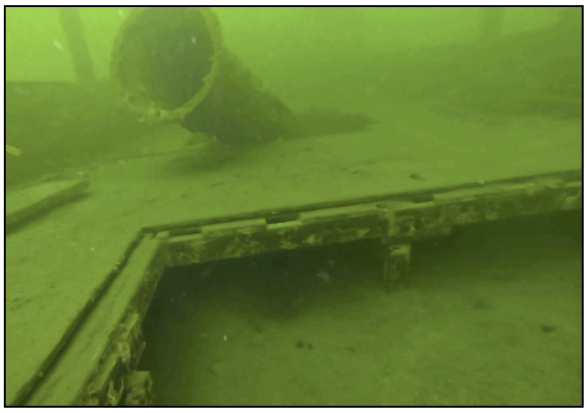
The *Hopkins/Minnetonka* (MNHS Album 111 #49, digitized by MHM)





Above: The *Hopkins/Minnetonka* bow.
Right: The *Hopkins/Minnetonka* stern.
Below Left: The *Hopkins/Minnetonka* bow superstructure.
Below Right: The smokestack inside the hull.
(all Kelly Nehowig)

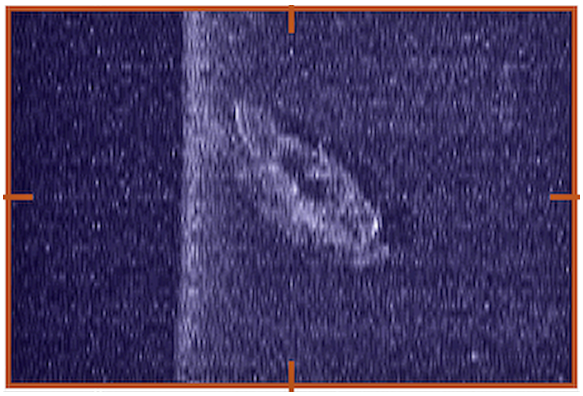




Update: *Priscilla* Wreck (21-HE-404)

The propeller steam tug *Priscilla* Wreck was 50.00 feet long and 15.00 feet wide. *Priscilla* was constructed in 1906 and owned by Captain John R. Johnson. For Johnson's Minnetonka Dredging Company, *Priscilla* towed the dredge *Napoleon* and other barges for jobs around the lake. By the mid-1920s, *Priscilla* was converted to internal combustion and continued in service for the dredging company until the early 1950s. *Priscilla* has sturdy bollard placement both fore and aft, a robust gunwale, and twin rubrails. A Danforth anchor is wedged into the wreck's rubrail, caught there from an unknown boat many years ago (Merriman and Olson 2012a, 42-43, 2013a, 11-13, 2015g). During the LMNA-4 Project, MHM investigated the *Priscilla* Wreck in person for the first time in early June 2015. The wreck is in the same condition as recorded by the Hennepin County Water Patrol's ROV in 2013, but MHM's visit to the wreck produced higher quality images of the site's details. The condition assessment performed during this project has determined the wreck is stable, and the hull has 18 inches of silt built-up inside. Currently the wreck is free of zebra mussels in 62 feet of water, but other sites

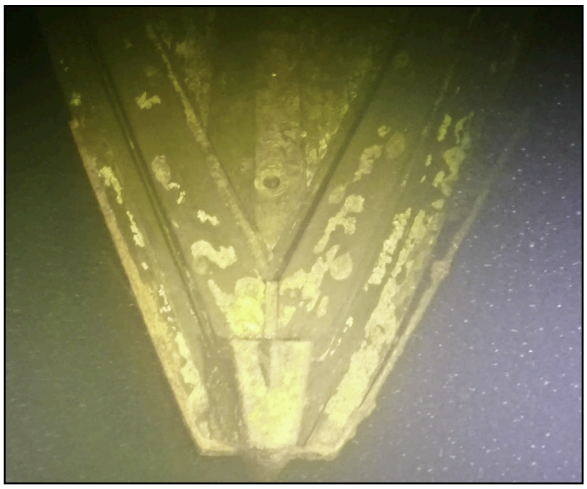
north of Big Island in this depth range have been infested with them; there is no obvious reason why *Priscilla* should be safe from this invasive species.



Sonar image of *Priscilla* (MHM).



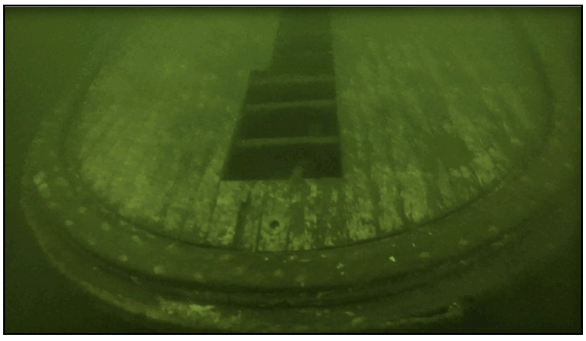
Priscilla (MNHS Album 111 #53, digitized by MHM).





Above: A bollard going through *Priscilla's* deck (Ed Nelson).

Left: *Priscilla's* Bow (Mark Slick).



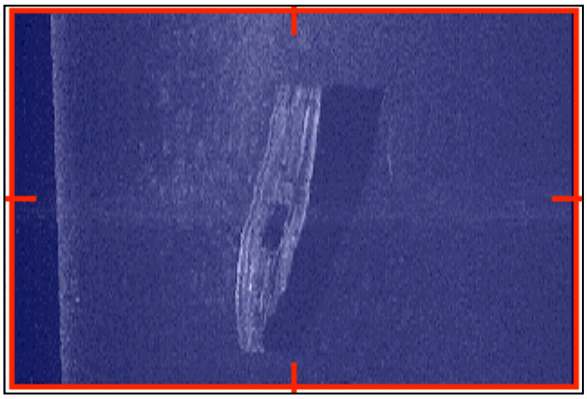
Priscilla's stern (Mark Slick).



Stairs going into the hull in the area where the pilot house once stood (Mark Slick).

Update: *Hercules* Wreck (21-HE-398)

The steam tugboat *Hercules* was constructed between December 1916 and May 1917 by the Twin City Rapid Transit Company at their Excelsior shop. The tug measured 50.00 feet long, 12.50 feet in the beam, and she was launched in early June 1917 for use in TCRT dock and boat maintenance. *Hercules* was sunk in 1926 with the *Como*, *Minnehaha*, and *White Bear*. Her superstructure and machinery were removed from her hull prior to her scuttling (Construction Records: Ledgers, TCRT Records 1926; Merriman and Olson 2012a, 37-38, 2015e). MHM dove on the *Hercules* Wreck for the first time during the LMNA-4 Project in early June 2015. The wreck is in good condition with bollards, deck, and gunwales intact; basically all that is missing from the wreck is her cabin, engine, and railings. The stern sits high enough off the lake bottom that it is possible to investigate the skeg and part of the rudder. As of early June 2015, the wreck is infested with zebra mussels and like the other deeper wrecks, this should not be the case in 45 feet of water. MHM submitted a site form update for the *Hercules* Wreck to the OSA in July 2015.



Sonar image of *Hercules* (MHM).



Hercules (MNHS HE5.14r35, digitized by MHM).



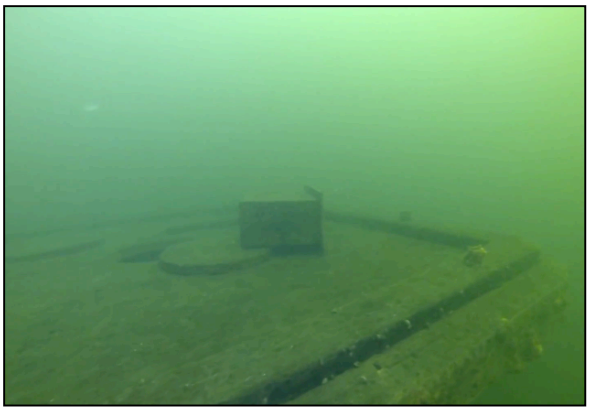
Starboard side forward (Markl Slick).



The bow of *Hercules* (Mark Slick).



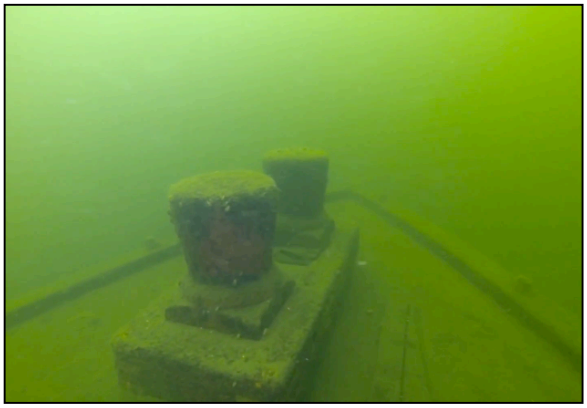
A cleat on the gunwale and double rubrails on the side of the hull (Kelly Nehowig).



The stern of *Hercules* (Kelly Nehowig).



Mark Slick lights the rudder and skeg of *Hercules* (Ed Nelson).

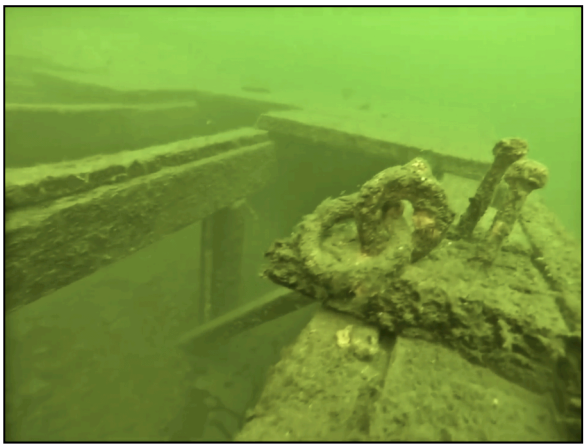


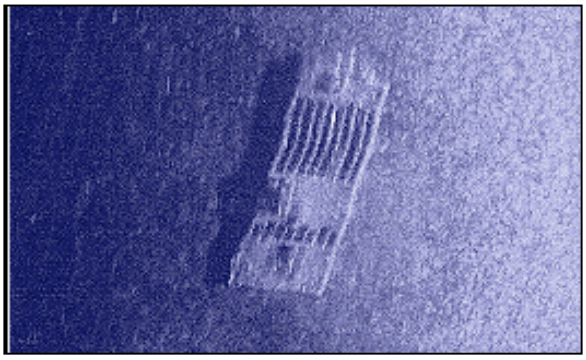
Bollards at the bow of *Hercules* (Kelly Nehowig)

Update: St. Albans Bay Wreck (21-HE-400)

The St. Albans Bay Wreck is a wooden piledriver/dredge of substantial construction and size. She is 70.00 feet long, 26.00 feet in the beam, and her depth of hold is 5 feet. There is an extendable leg, known as a spud, located at the stern of the wreck. Captain John R. Johnson's last known dredge was built over the winter of 1925-1926 and was described as "26 feet wide, exclusive of spuds, and 70 feet in length. It will have a freeboard of five feet", although the newspaper misused the term 'freeboard' (Merriman and Olson, 2012a, 39-42, 2013a, 14-16, 2015h; *Minnetonka Record* 1925d). A brief investigation of the St. Albans Bay Wreck by MHM's volunteers Kelly and Ann Nehowig was conducted in mid-June 2015 during the LMNA-4 Project. The purpose of the reconnaissance dive was to video the wreck in good visibility; often the wreck cannot be seen due to suspended particles in the water column. The wreck is in the same condition as the last time MHM documented the wreck, although there may be been a small zebra mussel infestation in 2013 that was questionable at the time. As of mid-June 2015, the wreck was free of zebra mussels, but that may not be the case in the near future. MHM submitted a site form update for the St. Albans Bay Wreck to the OSA in July 2015.

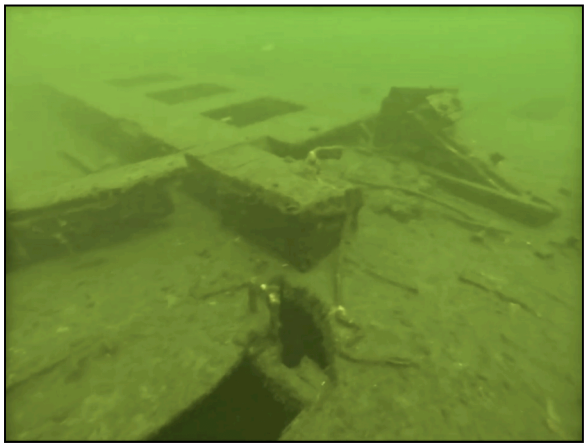
Right: Deck fittings and deck level stringers on the St. Albans Bay Wreck (Kelly Nehowig).





Sonar image of the St. Albans Bay Wreck (MHM).

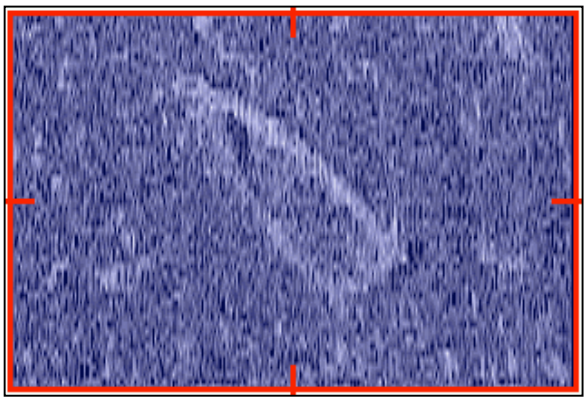
Right: A probable base for a dredge scoop (Kelly Nehowig).



Crystal Bay Rowboat Wreck (21-HE-457)

MHM recorded a sonar image of the Crystal Bay Rowboat Wreck (Anomaly 474) during the LMS-1 Project in November 2011 and identified the site in mid-June 2015. The wreck site is 13.00 feet long, 5.00 feet wide (the boat when floating had a narrower beam since the port side aft of the wreck has separated from the transom and fallen away a bit), and lies in 22 feet of water. Compared to three other wooden rowboat wrecks in Lake Minnetonka (Gideon Bay Wreck [21-HE-415], Wayzata Bay Rowboat Wreck [21-HE-417], St. Louis Bay Wreck [21-HE-422]), the Crystal Bay Rowboat Wreck is of similar size, but its construction is different. The three other small wooden wrecks have clinker-built (or lapstrake, where the planks overlap each other) hulls with wine-glass sterns. The Crystal Bay Rowboat Wreck is carvel-built (plank ends are attached edge-to-edge) with a square stern that has triangular braces on the port and starboard aft quarters at the gunwale level. The wreck's starboard gunwale is degraded and the stern is just beginning to be covered with zebra mussels. The vessel was constructed with numerous thin frames and futtocks that are clearly seen along the wreck's sides, with stringers running along the inner hull for longitudinal strength. Near the bow, a caprail survives on the port side gunwale. The square transom has two carrying handles attached on the port and starboard sides. There must have been thwarts that acted as seats and athwartships support that are no longer extant. There is 6.6 inches of silt in

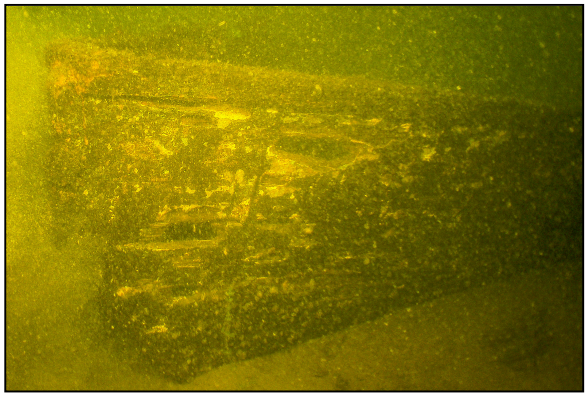
the wreck's hull. MHM contends the boat was constructed between the 1880s and early 1900s, and the wrecking process occurred prior to 1910, regardless of the small amount of sediment build-up (Merriman and Olson 2015c). MHM submitted an archaeological site form for the Crystal Bay Rowboat Wreck to the OSA in June 2015 and received her site number at that time.



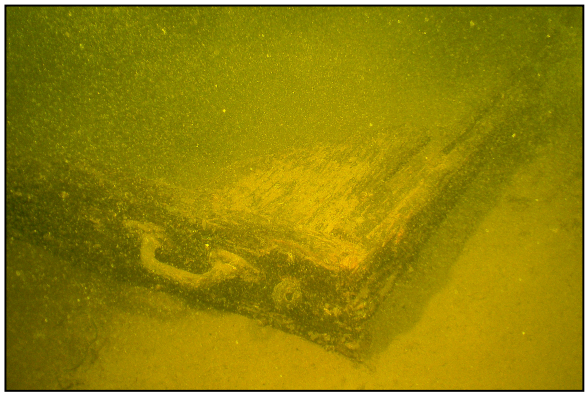
A sonar image of the Crystal Bay Rowboat Wreck (MHM).



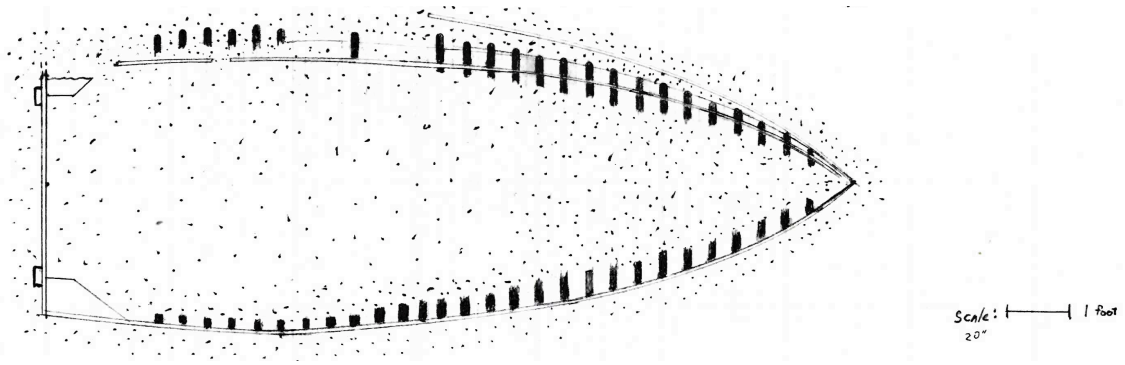
The forward inner hull (Mark Slick).



The bow (Mark Slick).



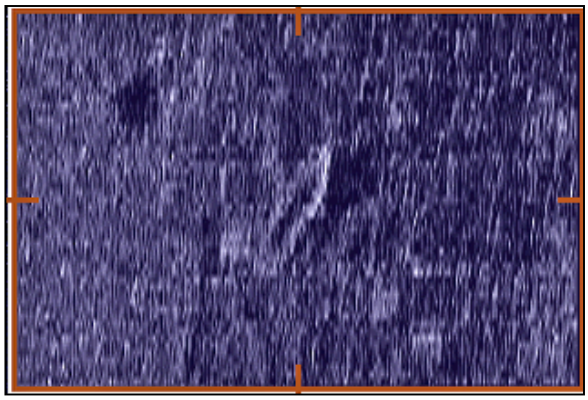
The transom stern with handles (Mark Slick).



A sketch of the Crystal Bay Wreck (Christopher Olson).

Maxwell Bay Rowboat Wreck (21-HE-469)

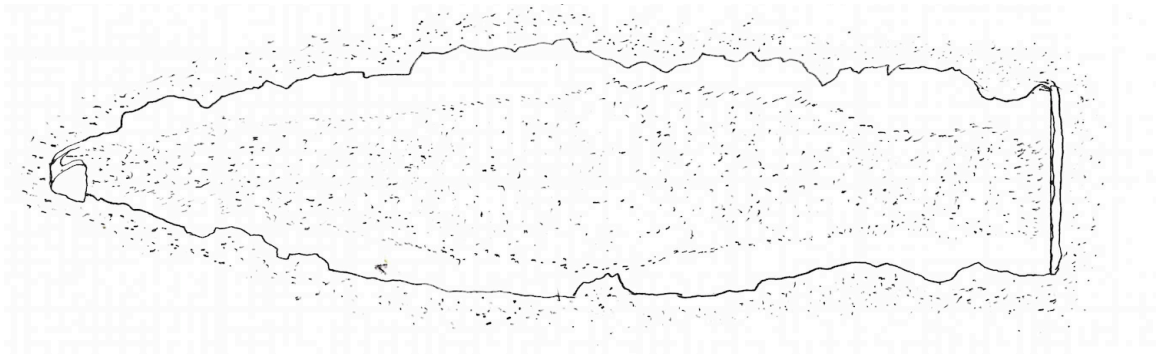
MHM recorded a sonar image of the Maxwell Bay Rowboat Wreck (Anomaly 78.2) during the LMS-2 Project in May 2012 and identified the site in late June 2015. The wreck site is 15.70 feet long, 3.70 feet wide, with a 3.20 wide transom. The wreck is the second carvel-built rowboat identified on the lake bottom - like the Crystal Bay Wreck - and extremely degraded. The wreck's port side aft quarter is nearly gone and the square transom partially survives. Forward, the stempost is complete. The vessel was constructed between the 1880s and the early 1900s, and likely sank prior to 1910 (Merriman and Olson 2015f). MHM submitted an archaeological site form for the Maxwell Bay Rowboat Wreck to the OSA in July 2015 and received her site number at that time.



A sonar image of the Maxwell Bay Rowboat Wreck (MHM).



The stern (Mark Slick).

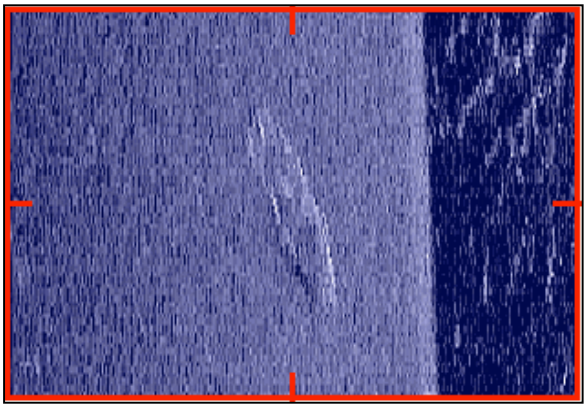


A sketch plan of the deteriorated Maxwell Bay Rowboat Wreck (Christopher Olson).

Correct Craft Utility Wreck (21-HE-467)

MHM recorded a sonar image of the Correct Craft Utility Wreck (Anomaly 5) during the Lake Minnetonka Survey 1 Project in November 2011 and in mid-June 2015, identified the site. Lying in 52 feet of water in an east-west orientation, the Correct Craft Utility

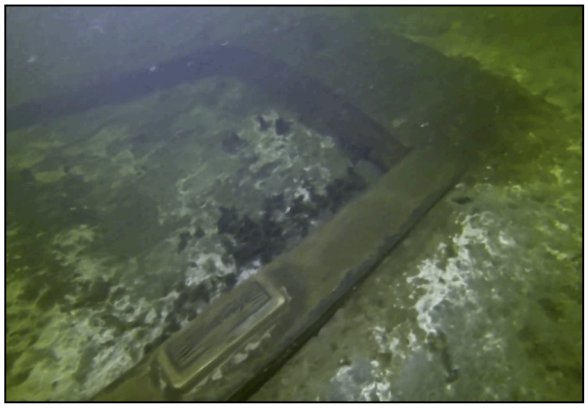
Wreck sank after July 1, 1959 (due to the presence of a registration number submitted to the boat owner in 1959) and before 1962 due to the lack of a year validation sticker alongside her registration number, MN 1489 AP. There is no evidence the wreck ever had a validation sticker, an attribute whose usage – determined from historical evidence – began in 1962. The site is 18.00 feet long and 6.80 feet wide. The visible parts of her wooden hull are in exceptional condition but she is buried in silt nearly to her gunwales, so her bottom hull cannot be assessed for damage that may have occurred in a collision. The boat's cockpit is intact, as is her engine cover (dog house), although the dog house lid has been opened and lies on top of the front cockpit. Regardless of the presence of a cockpit, the wreck is a utility and not a runabout due to the open nature of the aft portion of the boat and the ability to walk around the dog house. All of the wreck's metal fittings - chocks, cleats, windshield frame, navigation lights, dashboard plate, step pad backs, mast light shaft and base, gas tank cover, and even the ignition key - are all in place. All the rubber components that can be seen - the step pads - are extant. The plastic attributes that can be seen - the steering wheel (made of bakelite?) - is intact. MHM cannot determine the reason for her sinking at this time, but on-going research using contemporary newspaper accounts may provide more data. There is 2.35 feet of silt accumulated in the wreck's hull. Assuming a sinking date of 1962, the amount of silt build-up per year on average is .53 inches. Additionally, a large pile of silt accumulation on the wreck's foredeck is unique; no other wreck MHM has located to date has this attribute. This silt build-up data will assist MHM in determining the sinking dates of other submerged resources in this part of Crystal Bay (Merriman and Olson 2015b). One historical anomaly associated with the wreck's registration number, MN 1489 AP, is the fact that the license is currently active and assigned to a 1969 14-foot Lund boat. The 'AP' letter segment, assigned in 1959, should not be attached to a boat manufactured in 1969. Apparently the same person registered the Correct Craft and the Lund, simply submitting paperwork for the same number on a different boat. Before computerization, this practice would be difficult to prevent, especially prior to November 1, 1972 when boat hull identification numbers (HIN) were required on all boats build in the United States or imported into the country (John Nordby, personal communication, 25 June 2015; National Association of State Boating Law Administrators ND).



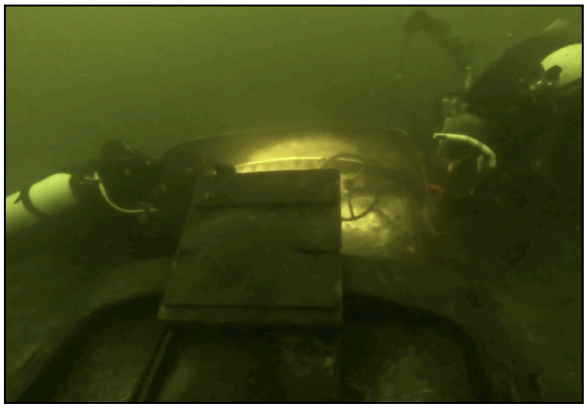
A sonar image of the Correct Craft Utility Wreck (MHM).



The Correct Craft Utility Wreck (Kelly Nehowig).



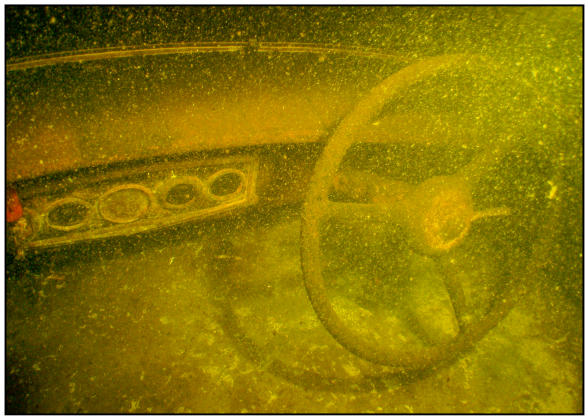
Amidships and the stern, with a cursive Correct Craft step pad in the foreground (Kelly Nehowig).



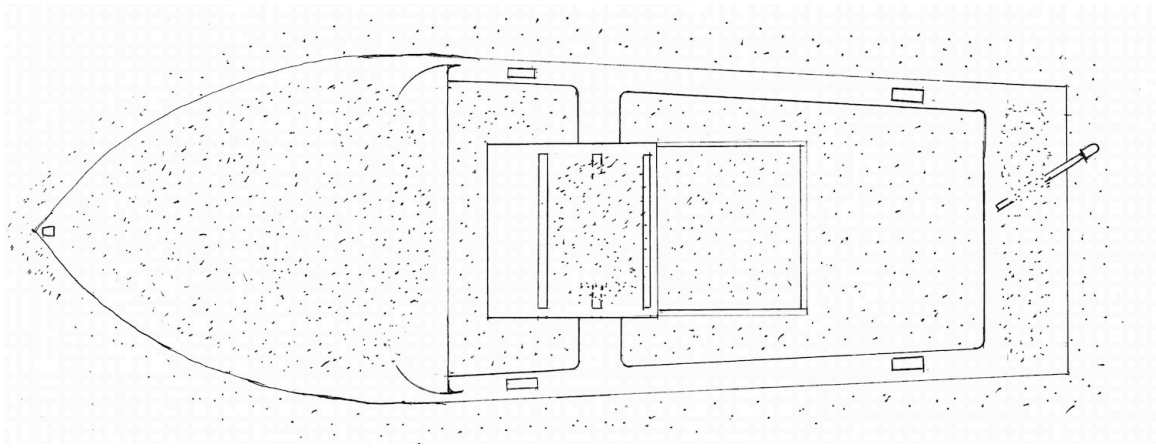
Mark Slick and Christopher Olson investigating the cockpit. The rectangular piece of wood is the dislodged doghouse top (Kelly Nehowig).



The wreck's registration number - MN 1489 AP on the starboard side (Mark Slick).



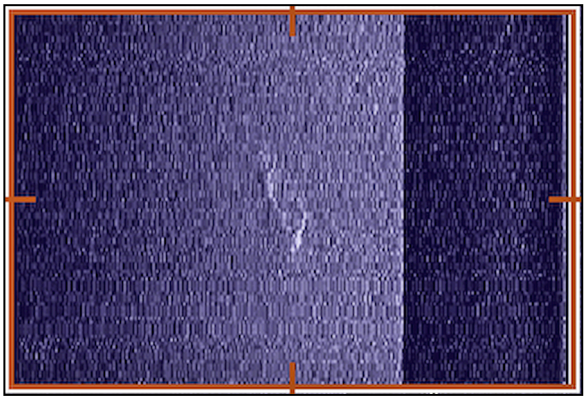
The dashboard and steering wheel (Mark Slick).



A sketch plan of the Correct Craft Utility Wreck (Christopher Olson).

Wooden Motor Boat Wreck (Anomaly 467)

MHM recorded a sonar image of the Wooden Motor Boat Wreck (Anomaly 467) during the LMS-2 Project in May 2012 and in early July 2015 identified the site. The Wooden Motor Boat Wreck is 13.50 feet long and 4.50 feet in the beam. She is carvel-built with intact gunwales, with the exception of a large slice taken out of the hull on the starboard side, and a partial surviving caprail. The wreck has a pointed bow with a towing ring and line attached to it, a square transom, narrow frames are extant throughout the hull, and a stringer runs longitudinally just above the turn of the bilge on both sides. At gunwale level on the starboard side there is a semi-triangular brace on the stern quarter, there is a vertical knee in the center of the transom for strength when the vessel carried a motor, the transom edge amidships is also reinforced, and the stempost is intact. The boat would have had one or more seats in the form of thwarts that may survive, dislodged and lying under the silt in side the hull. One metal oarlock is attached to the gunwale on the starboard side and the wreck is held together with slot-headed woodscrews. Some white paint survives on both the inner and outer hull. The wreck's registration number is MN 6061 AS, indicating she was first registered in 1960, and she may have a Minnesota-shaped year validation sticker on her port side. The registration number is also the primary evidence that the boat carried a motor since smaller human-powered row boats did not require licensing. The registration number attached to this wreck, MN 6061 AS, is listed in the DNR records as belonging to a 1971 14-foot Sears aluminum boat that last registered in 1999. Therefore, just like the Correct Craft Utility Wreck, the owner of the Wooden Motor Boat Wreck probably transferred the number from this boat to their new 1971 Sears boat (John Nordby, personal communication, 6 July 2015). The registration number 'mix-up' confirms that the Wooden Motor Boat Wreck sank prior to 1972, the first year of boat license records to survive. Anomaly 467 is classified as an historical cultural resource and is protected under the jurisdiction of the DNR until late 2022 when she can be designated as a nautical archaeological site through the OSA.



A sonar image of the Wooden Motor Boat Wreck (MHM).



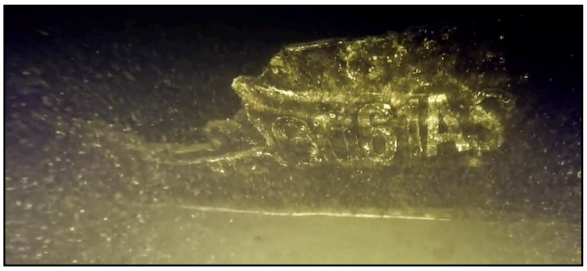
The stern and amidships of the Wooden Motor Boat Wreck (Mark Slick).



The bow and amidships (Mark Slick).



Frames and a stringer on the innter hull, with traces of white paint (Mark Slick).

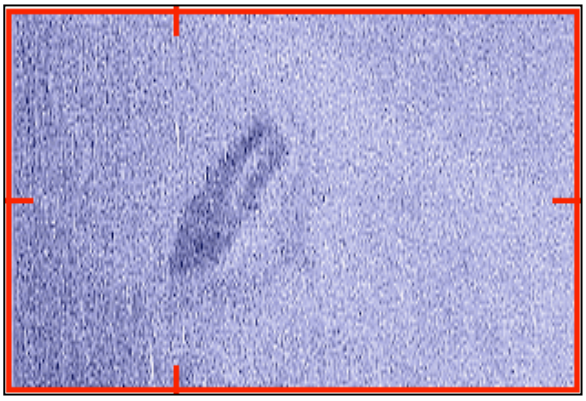


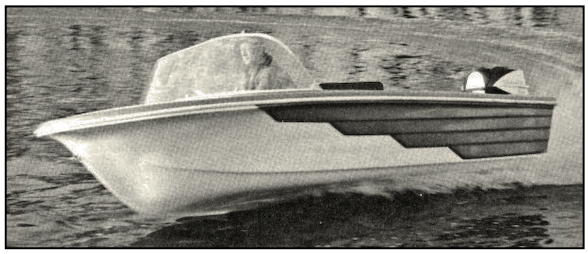
The Wooden Motor Boat Wreck's registration number, MN 6061 AS, on the starboard side (Mark Slick).

Span America Nomad Runabout Wreck (Anomaly 126.1)

MHM recorded a sonar image of the Span America Nomad Runabout Wreck (Anomaly 125.1) during the LMS-2 Project in May 2012 and identified the site in early June 2015. The wreck is 13.70 feet long with a 5.70 foot beam and is made of fiberglass. Her hull is blue and white, her front and back seats are missing, and her cleats, step pads, and mast light connector are extant. Her dashboard dials are missing and she carries no outboard motor or gas tank. The missing motor and gas tank suggests she was scuttled intentionally; the missing dials may have been removed prior to that action. The wreck's registration number is MN 0874 BG and a 1993 validation sticker is affixed to the hull, her last year of licensing. The BG letter sequence was assigned to watercraft first registering in 1962 in Minnesota. DNR records indicate this wreck is a 1964 Span America (John Nordby, personal communication, 6 June 2015), but this cannot be possible. Often boats were registered under the wrong year of manufacture upon its sale or when a new title was issued. Evidence recorded on the wreck that indicates she is a 1962 model is the logo design that survives on her starboard stern quarter. This particular design was used by Span America in 1961 and 1962 only, and the 1962 Nomad model was exactly 13.70 feet long as opposed to a bit shorter in 1961. The 1962 Nomad model was offered as a utility or runabout; the wreck has two benches that would have held seats, indicating she is a runabout. Span America operated out of Red Wing, MN in 1962, making the wreck of local construction (Span America Boat

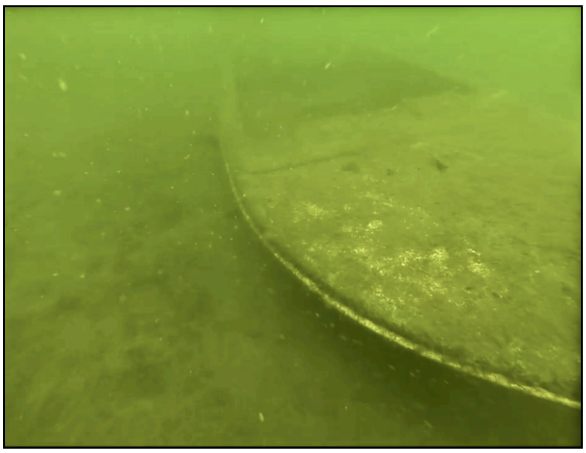
Company, Inc. 1962). Anomaly 126.1 is classified as an historical cultural resource and is protected under the jurisdiction of the DNR until late 2043 when she can be designated as a nautical archaeological site through the OSA.



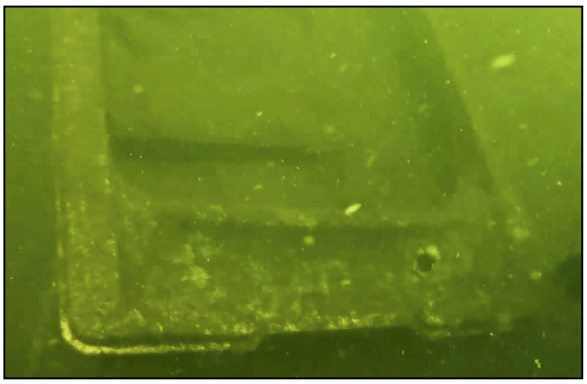


Above: A Span America Nomad (Span America Boat Company, Inc. 1962).

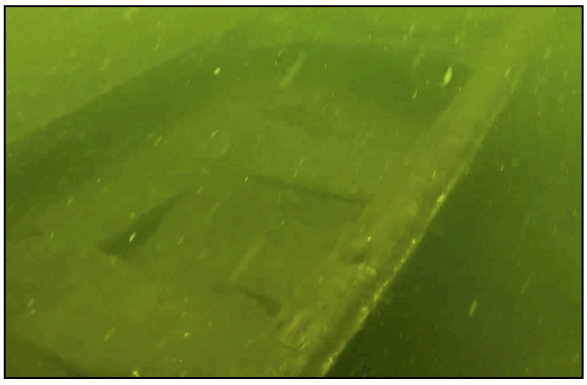
Left: A sonar image of the Span America Nomad Runabout Wreck



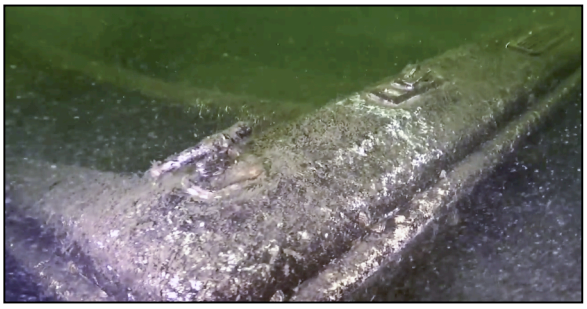
The starboard forward quarter of the Span America Nomad Runabout Wreck (Kelly Nehowig).



The stern (Mark Slick).



Amidships (Mark Slick).



A cleat, mast light socket, and step pad on the starboard aft quarter (Mark Slick).



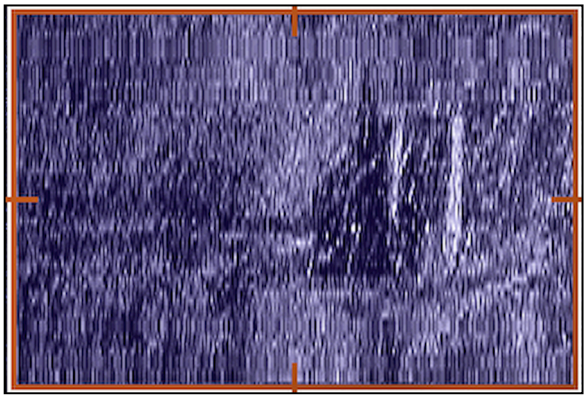
Above: The Span America logo on the wreck's starboard after quarter panel.

Right: The same logo on another Span America boat. This logo design was only used by the company in 1961-1962.



Larson Delta Sport Cruiser 7000 Wreck (Anomaly 464)

MHM recorded a sonar image of the Larson Delta Sport Cruiser Wreck (Anomaly 464) during the LMS-2 Project in May 2012 and dove on the site in early July 2015. The wreck is a fiberglass boat that was powered by an inboard/outboard engine, manufactured in Little Falls, MN. The wreck is 21.25 feet long with an 8.00 beam, has a bow cuddy, a stern swimming platform and ladder, and her stern quarters have a line of air scoops for hull venting. The wreck retains all of her fittings such as cleats, dash dials, windshield, railings, and a bimini top. Her seats are intact and there are cushions in the cuddy, along with all other fittings. The wreck's registration number is MN 3559 EE, a designation attained in 1980, and she was last registered in 1982 (John Nordby, personal communication, 6 July 2015). There is no obvious damage to the wreck's hull that could explain her sinking, but damage may be evident under the silt or the outdrive's boot may have failed. The vessel may have been sunk intentionally, but most often the engine and other valuable items would have been stripped from the boat prior to the scuttling. The hull is white with red/burgundy accents and bimini top. Anomaly 464 is classified as an historical cultural resource and is protected under the jurisdiction of the DNR until late 2032 when she can be designated as a nautical archaeological site through the OSA.



A sonar image of the Larson Delta Sport Cruiser 7000 (MHM).



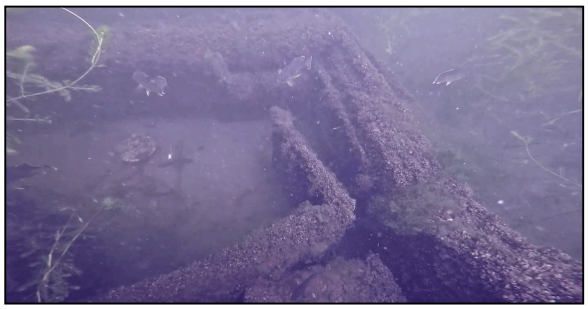
Larson Delta Sport Cruiser 7000 (Larson 1981).



The foredeck (Mark Slick).



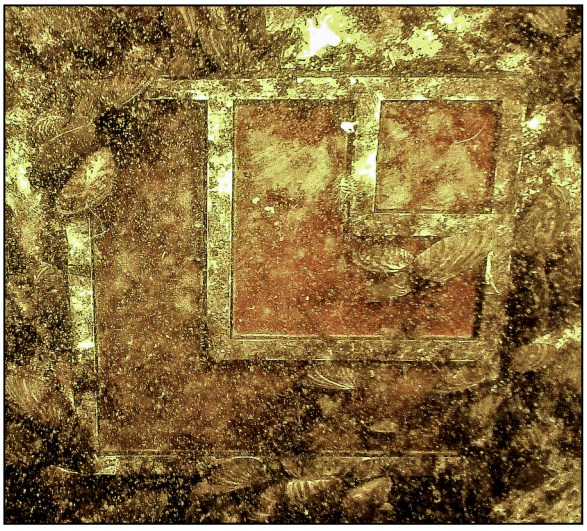
The front passenger seat (Mark Slick).



The folded bimini top (Mark Slick).



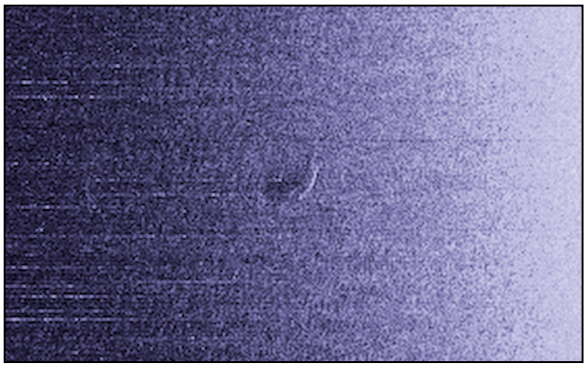
The dashboard and steering wheel (Mark Slick).



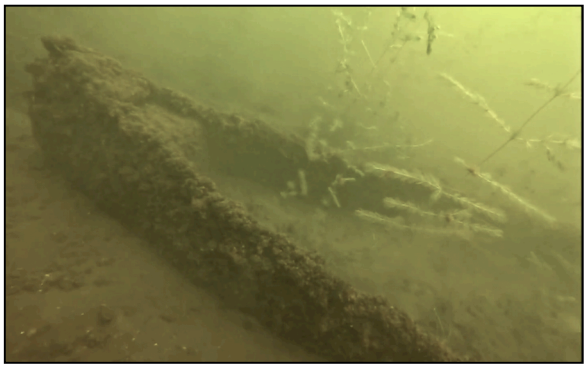
The Larson logo on the outer hull (Mark Slick).

Half Canoe Wreck (Anomaly 500)

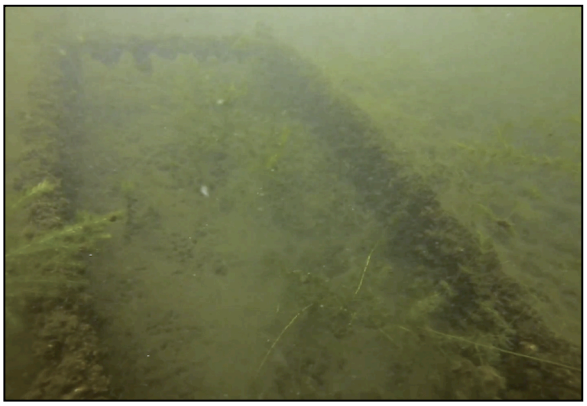
MHM recorded a sonar image of the Half Canoe Wreck (Anomaly 500) during the LMS-1 Project in November 2011 and identified the site in mid-July 2015. The wreck is literally the bow half of an aluminum canoe. The wreck is 8.70 feet long and 2.80 feet wide amidships. There is a round registration sticker evident on the starboard side, but it is unreadable. One thwart survives and the bow is enclosed. No seats are evident and the canoe appears to have split apart at a riveted seam. The wreck is classified as an historical cultural resource and is protected under the jurisdiction of the DNR.



A sonar image of the Half Canoe Wreck (MHM).



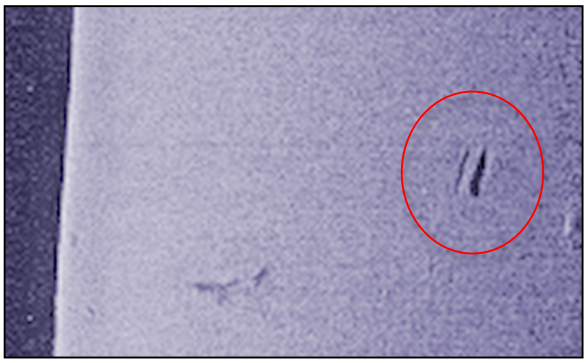
The Half Canoe Wreck (Kelly Nehowig).



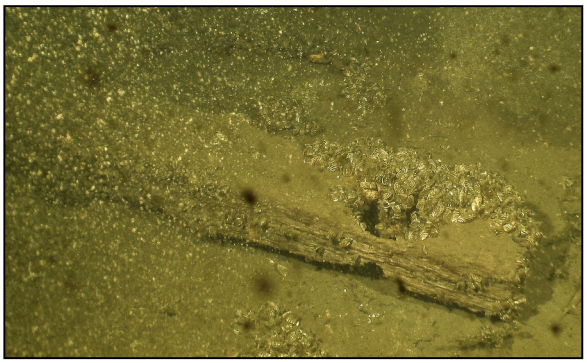
Looking toward the surviving thwart and the missing end (Kelly Nehowig).

Wooden Sailboat Mast or Boom Site (Anomaly 291.1)

MHM recorded a sonar image of the Wooden Sailboat Mast or Boom Site (Anomaly 291.1) during the LMS-1 Project in November 2011 and in early July 2015 identified the site. Anomaly 291.1 is 16.10 feet long by 6 inches square in cross section. The wood is tapered at the top with a hole drilled through to receive a line. A line is attached to the artifact but it does not thread through the hole. The artifact is classified as an historical cultural resource and is protected under the jurisdiction of the DNR.



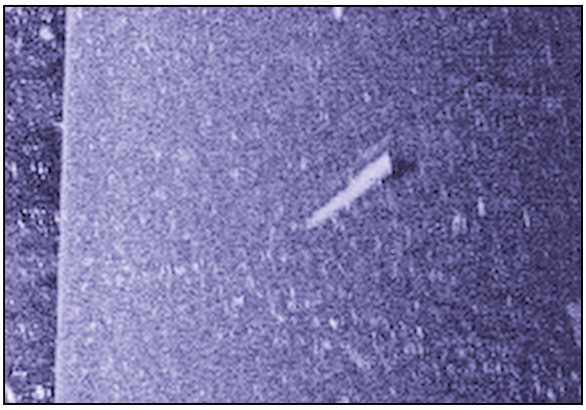
A sonar image of the Wooden Mast or Boom Site (MHM).



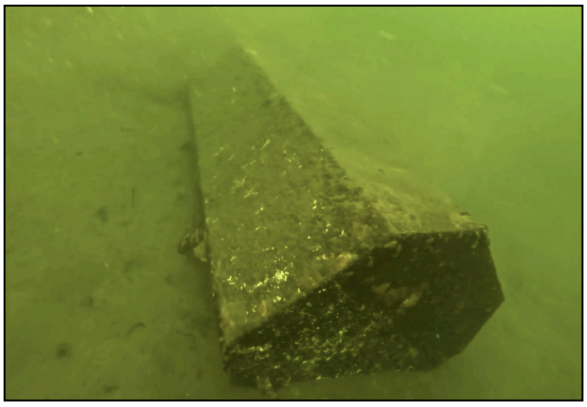
The end of the Wooden Mast or Boom Site (Mark Slick).

Metal Pontoon Sites (Anomalies 477, 478)

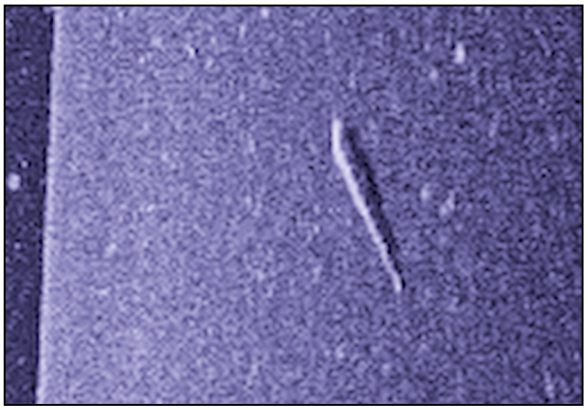
MHM recorded a sonar image of the metal Pontoon Sites (Anomalies 477 and 478) during the LMS-1 Project in November 2011 and in mid-June 2015 identified these two sites that lie 115 feet from each other. Once Anomaly 478 was identified, the assumption before diving on Anomaly 477 was that the pontoons would be identical in design due to their proximity to each other, but this is not the case. Anomaly 478 is nearly square in cross-section with an angular tapered end. This pontoon is 22.50 feet long by 2.30 feet by 1.70 feet. It has metal ridges on top that would attach to the pontoon boat's platform. Anomaly 477 is hexagonal and measures 23.70 feet long by 2.30 feet in diameter. The top of this pontoon has holes that served as attachment points for the pontoon deck. Anomalies 477 and 478 are classified as historical cultural resources and are protected under the jurisdiction of the DNR.



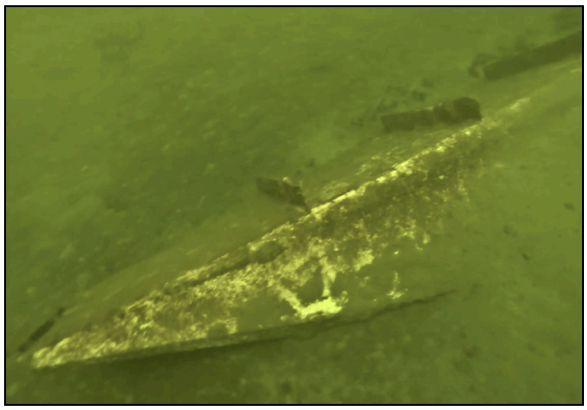
A sonar image of the hexagonal pontoon (MHM).



The hexagonal pontoon, Anomaly 477 (Kelly Nehowig).



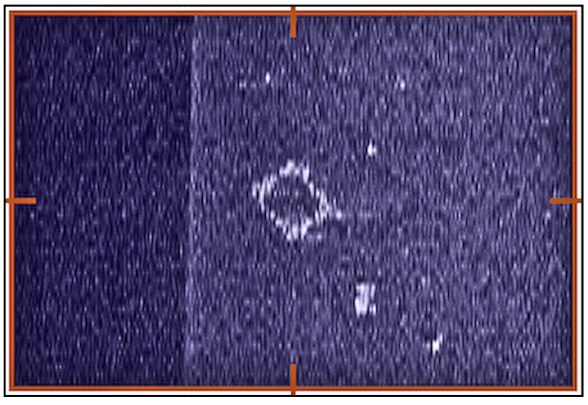
A sonar image of the tapered pontoon (MHM).



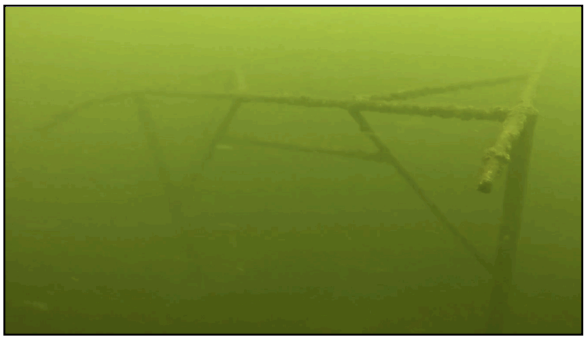
The tapered pontoon, Anomaly 478 (Kelly Nehowig).

Boat Canopy Frame Site (Anomaly 110)

MHM recorded a sonar image of the Boat Canopy Frame Site (Anomaly 110) during the LMS-2 Project in May 2012 and in early July 2015 identified the site. The frame is 14.10 feet by 8.00 feet, sits 5.00 feet off the lake bottom, and is constructed of steel. It may have detached from a nearby dock during high winds or it may have been intentionally scuttled. There is no boat lift mechanism evident, an attribute often associated with boat canopy frames, and the canopy is missing. The design of the frame is flat on the top, not peaked like other, larger frames.



A sonar image of the Boat Canopy Frame (MHM).

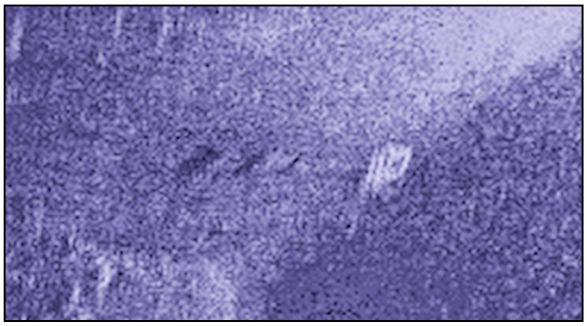


The Boat Canopy Frame is standing on end (Mark Slick).

Boat Canopy Frame Site 2 (Anomaly 269)

MHM recorded a sonar image of the Boat Canopy Frame Site 2 (Anomaly 269) during the LMS-1 Project in September 2011 and in mid-August 2015 identified the site. The frame is 10.20 feet by 8.00 feet by 3.50 feet, and is constructed of steel. It may have detached from a nearby dock during high winds or it may have been intentionally scuttled. There is no boat lift mechanism evident, an attribute often associated with boat

canopy frames, and the canopy is missing. The design of the frame is flat on the top, not peaked like other, larger frames.



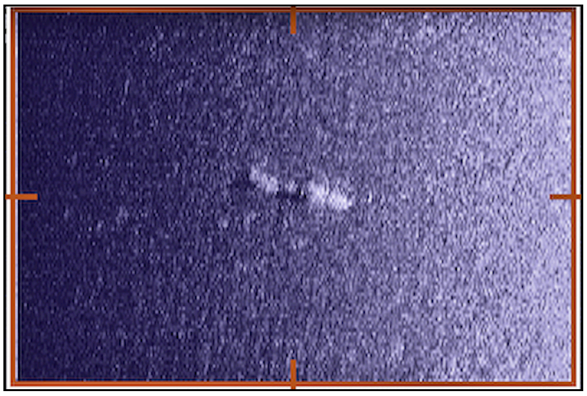
Sonar image of the Boat Canopy Frame 2 (MHM).



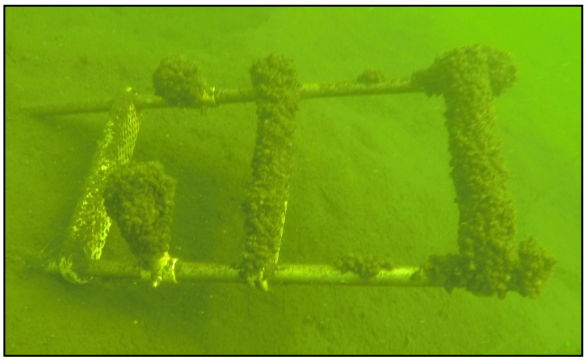
The Boat Canopy Frame 2 (Mark Slick).

Boat Ladder (Anomaly 62)

MHM recorded a sonar image of Anomaly 62 September 2011 and volunteers Kelly and Ann Nehowig dove on it in mid-June 2015, determining it is a partially buried boat ladder. The ladder is made of metal, plastic, and rubber with small arms that would hold it away from the hull of a boat while curved arms (currently buried) would settle over a boat's gunwale. Anomaly 62 is a cultural resource that is protected under the jurisdiction of the DNR.



A sonar image of Anomaly 62.

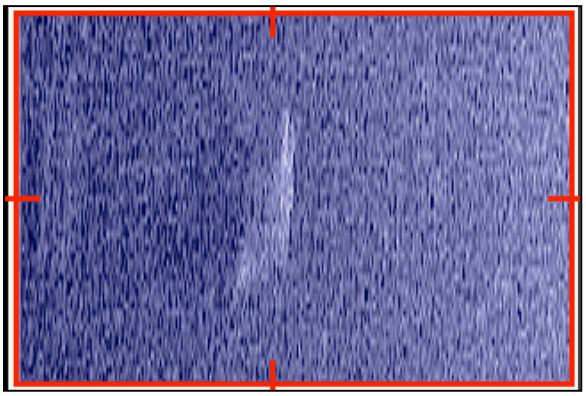


The Boat Ladder (Kelly Nehowig).

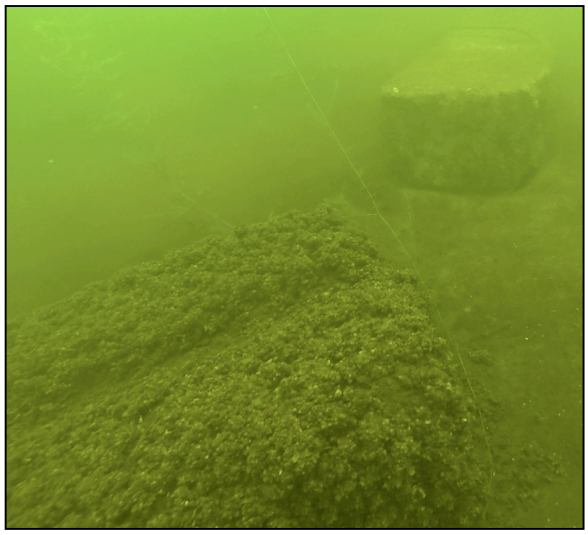
Buoy Anchors Site (Anomaly 185)

MHM recorded a sonar image of Anomaly 185 in September 2011 and identified the site in mid-July 2015. The Buoy Anchors Site consists of two large concrete pieces, one with a metal cable wrapped around it held together by a clevis. This object has no zebra mussels attached to it and it measures 5.50 feet long by 2.20 feet wide and stands 1.60 feet off the lake bottom. The other concrete chunk is completely covered in the invasive

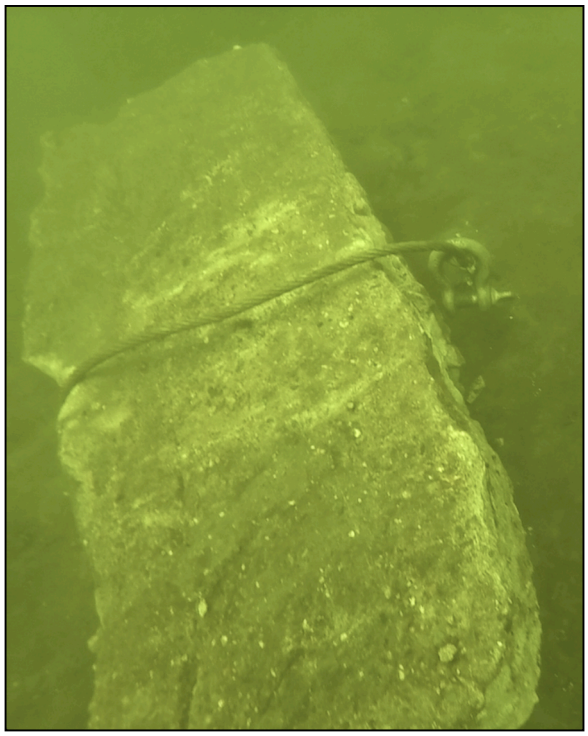
species and measures 6.20 feet long, 2.10 feet wide, and stands 1.90 feet off the bottom; It cannot be determined if it has a metal cable wrapped around it. The composition of the site is an issue; it does not match the sonar image. The acoustical signature indicates that there is one object at the site, not two different pieces that are at angles to each other. MHM contends that the concrete piece with the cable and without the zebra mussels is 'newer' than the other piece, and was only dropped onto the lake bottom since September 2011. MHM does not know why buoy anchors would be located in this spot in the lake. Anomaly 185 is a cultural resource that is protected under the jurisdiction of the DNR.

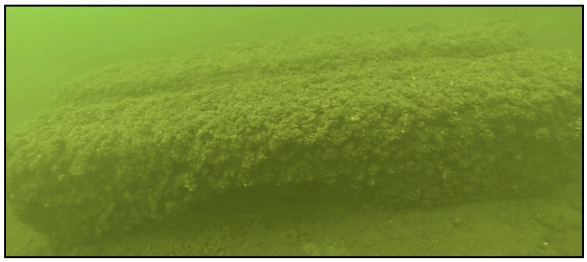


A sonar image of Anomaly 185 (MHM).



The stone anchor covered in zebra mussels with the other anchor in the background (Kelly Nehowig).



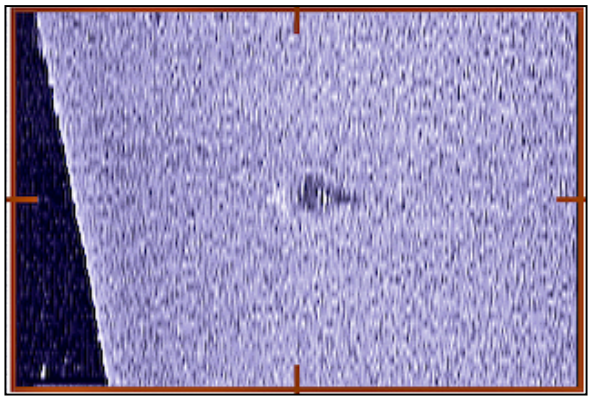


The anchor covered in zebra mussels (Kelly Nehowig).

Left: The stone anchor with a metal cable attached to it (Kelly Nehowig).

Polaris Indy 500 Classic Snowmobile (Anomaly 289)

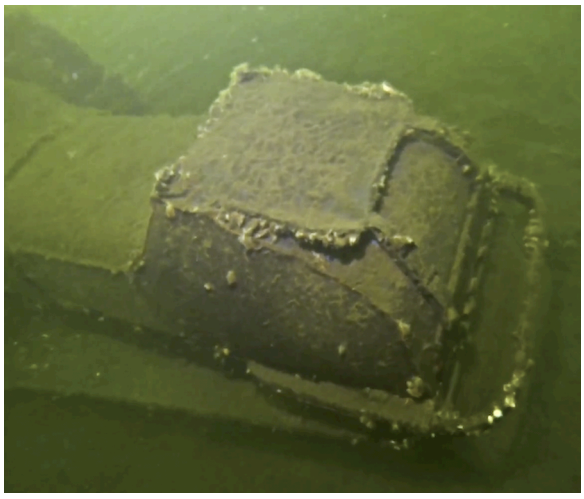
MHM recorded a sonar image of Anomaly 289 in September 2011 and identified the site in mid-July 2015. The Polaris Indy 500 Classic Snowmobile is a 1990 model and its primary color is blue. It appears that the Polaris has all of its dials, windshield, and seat are intact. The date of sinking is unknown, but it went through thin ice prior to September 2011 when it was recorded on sonar. The site measures 8.40 feet long by 3.60 feet wide. Anomaly 289 is a cultural resource that is protected under the jurisdiction of the DNR.



A sonar image of the Polaris Indy 500 Classic Snowmobile (MHM).



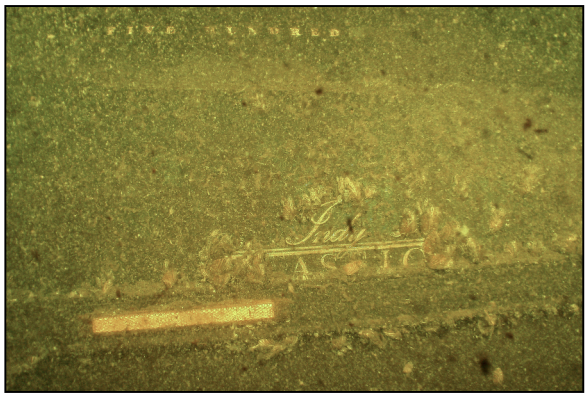
The right side rear storage bag and a red reflector (Mark Slick).



The storage bag and seat (Kelly Nehowig).



The engine cover and windshield (Kelly Nehowig).



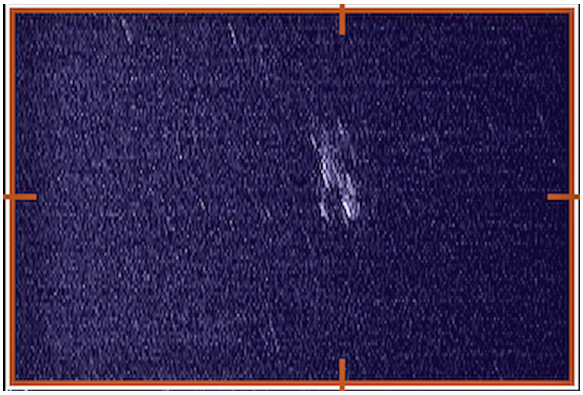
Polaris Indy 500 Classic markings (Mark Slick).



A blue 1990 Indy 500 Classic snowmobile.

Red Dodge Ram Laramie SLT Pickup Truck (Anomaly 27)

The Red Dodge Ram Laramie SLT Pickup Truck Site was created recently, sometime between 1994 (the first year this model with certain present attributes was offered) and November 2011, when the first sonar image of it was recorded. The truck has an extended cab and the windows were open when it fell through the ice. It is substantially buried in silt and neither of its license plates can be read. Its year of manufacture cannot be ascertained at this time. The site measures 19.7 feet long by 6 feet wide. Anomaly 27 is a cultural resource that is protected under the jurisdiction of the DNR.



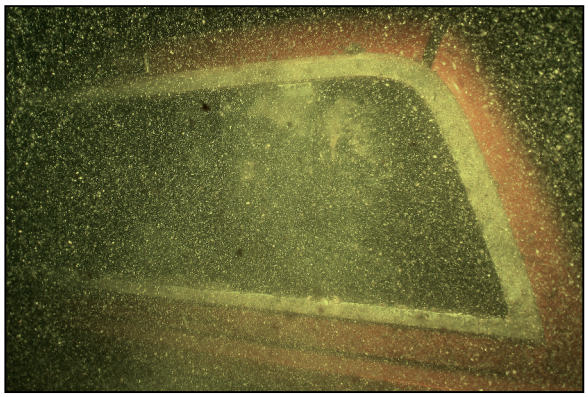
A sonar image of the Dodge Ram Laramie SLT Pickup Truck (MHM).



A Dodge emblem on the tailgate (Mark Slick).



A Dodge Laramie SLT.



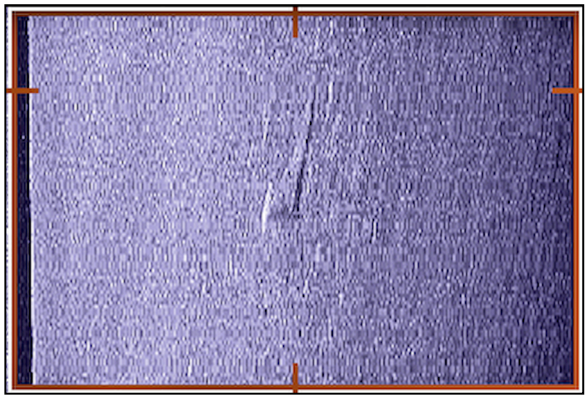
The rear window of the cab (Mark Slick).



A Laramie SLT logo on the pillar (Mark Slick).

Metal Pole and Electrical Box (Anomaly 468)

MHM recorded a sonar image of Anomaly 468 in May 2012 and identified the site in early July 2015 as a metal pole with an electrical box attached to it. It is profusely covered in zebra mussels and it likely was detached from a dock. The pole measures 2.00 inches in diameter and 17.50 feet long, while the box is 2.50 by 1.60 feet. Anomaly 468 is a cultural resource that is protected under the jurisdiction of the DNR.



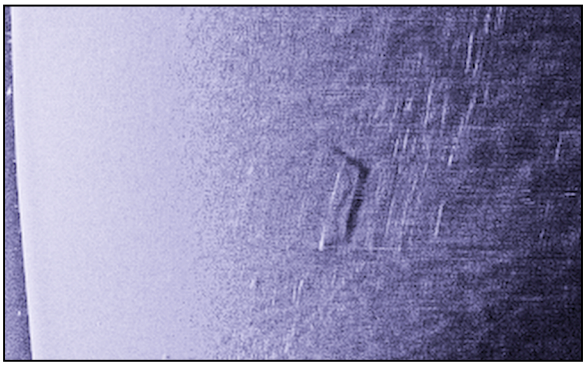
A sonar image of Anomaly 468 (MHM).



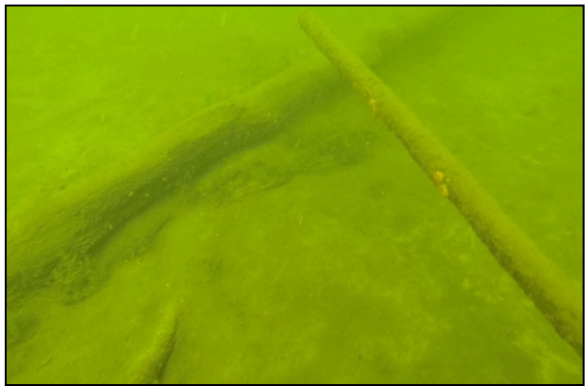
The Electrical Box with the Metal Pole leading off it (Mark Slick).

Metal Pipe (Anomaly 121.1)

MHM recorded a sonar image of Anomaly 121.1 in May 2012 and identified the site in early June 2015 as a metal pipe associated with part of a tree. The sonar image of this anomaly suggested it was a buried structure, like a barge or a dock. In reality, the metal pipe was sitting at an angle over part of a tree and the acoustical shadow looked like a long rectangular object was buried at this location. The pipe itself appears to be from a dock section. Anomaly 121.1 is a cultural resource that is protected under the jurisdiction of the DNR.



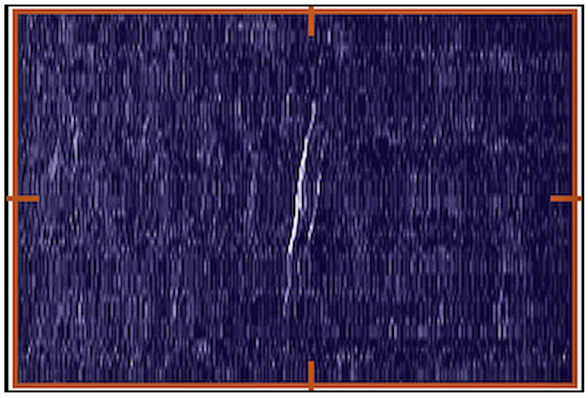
A sonar image of Anomaly 121.1 (MHM).



Anomaly 121.1: a pipe crossing a piece of wood (Kelly Nehowig).

Metal Box (Anomaly 466)

MHM recorded a sonar image of Anomaly 466 in May 2012 and identified the site in early July 2015 as a metal box. The metal is degraded and It measures 2.50 by 2.00 feet. Anomaly 466 is a cultural resource that is protected under the jurisdiction of the DNR.



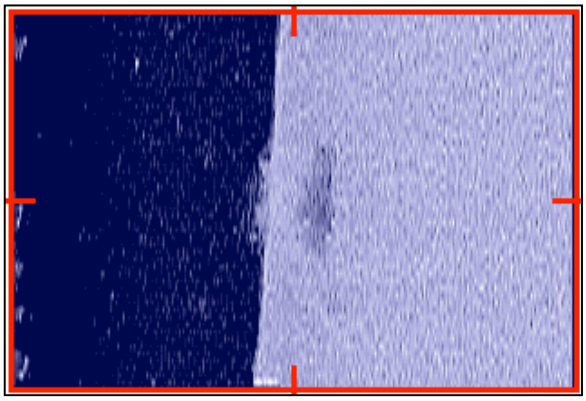
The sonar image of the Metal Box is distorted because the survey boat must have slowed down as it crossed over the anomaly (MHM).



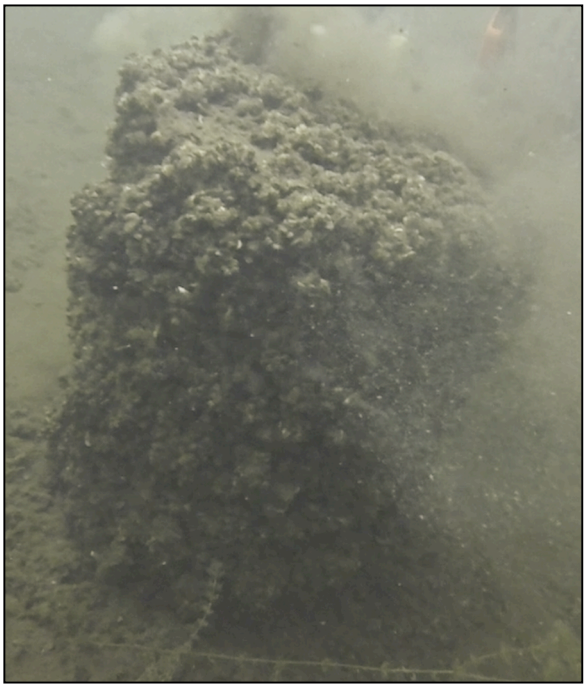
The Metal Box (Mark Slick).

Small Metal Drum (Anomaly 220)

MHM recorded a sonar image of Anomaly 220 in September 2011 and identified the site in mid-July 2015 as a small metal drum. It is profusely covered in zebra mussels and its contents are unknown. It measures 1.70 feet in diameter and stands 2.0 feet off the bottom of the lake. Anomaly 220 is a cultural resource that is protected under the jurisdiction of the DNR.



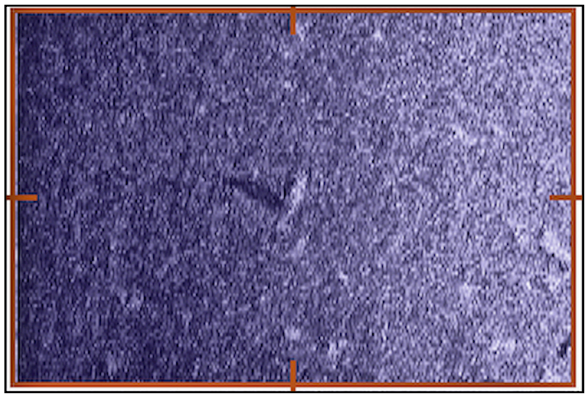
Above: A sonar image of the Small Metal Drum (MHM).



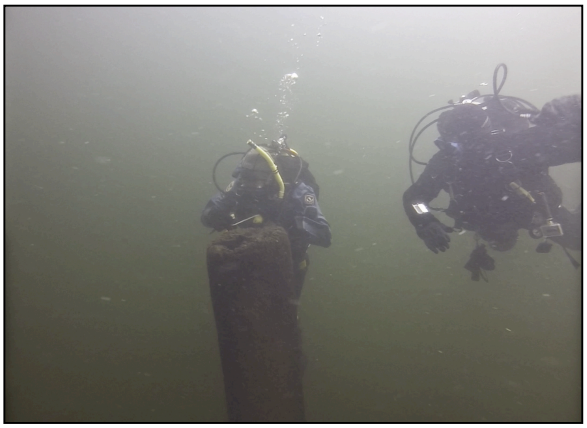
Right: The Small Metal Drum is covered in zebra mussels (Kelly Nehowig).

The Old Man of St. Albans Bay (Anomaly 70)

MHM recorded a sonar image of Anomaly 70 in September 2011 and identified the site in mid-July 2015 as a cut log - most likely a 'lost' piling for a dock - standing upright on the lake bottom, suspended in the water column. MHM has named the log "The Old Man of St. Albans Bay" in deference to "The Old Man of the Lake", a log that has been floating upright in Oregon's Crater Lake since at least 1896. The Oregon example sticks out of the water, while Anomaly 70 does not break the surface and is not a hazard to navigation. It measures 10.70 feet tall and 1.30 feet in diameter. Regardless of the fact that The Old Man is essentially a cut tree - a log - it is an artifact because it has been modified by humans. Anomaly 70 is a cultural resource that is protected under the jurisdiction of the DNR.



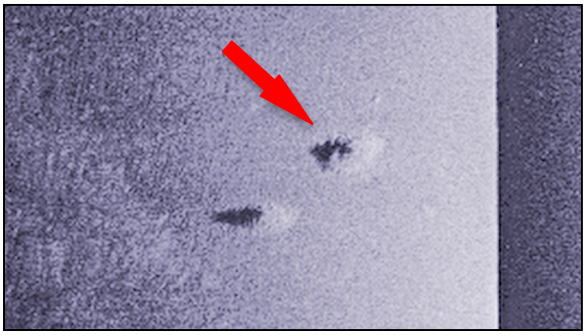
A sonar image of The Old Man of St. Albans Bay (MHM).



The top of The Old Man of St. Albans Bay (Kelly Nehowig).

Rubble Piles (Anomaly 544)

In November 2011, MHM recorded a sonar image of two similar objects near each other, but not near enough to each other to cover during the same dive. In mid-August 2015, one of the objects was identified as a collection of bricks, metal, and ceramic sewer pipe. It is assumed the Rubble Pile was discarded after a structure was torn down, either left on the ice or dumped from a barge. The other pile will be investigated in the future. Anomaly 544 is a cultural resource that is protected under the jurisdiction of the DNR.



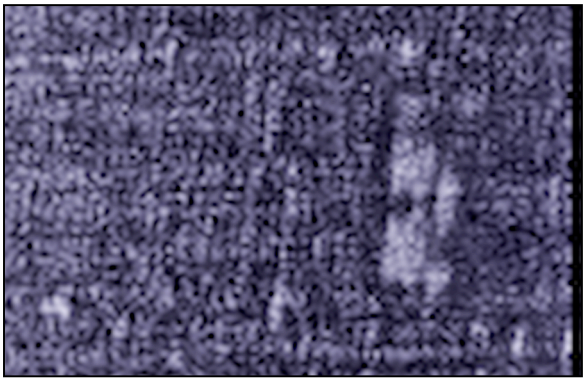
A sonar image of Anomaly 544; the arrow indicates the one Rubble Pile that was identified. The other pile will be investigated in the future (MHM).



The majority of the Rubble Pile is comprised of bricks (Mark Slick).

Bent Boat Ladder (Anomaly 514)

MHM recorded a sonar image of Anomaly 514 in September 2011 and it was identified in late August 2015 as a bent boat ladder. The ladder is made of aluminum, plastic, and rubber with small arms that would hold it away from the hull of a boat while curved arms would settle over a boat's gunwale. Anomaly 514 is a cultural resource that is protected under the jurisdiction of the DNR.



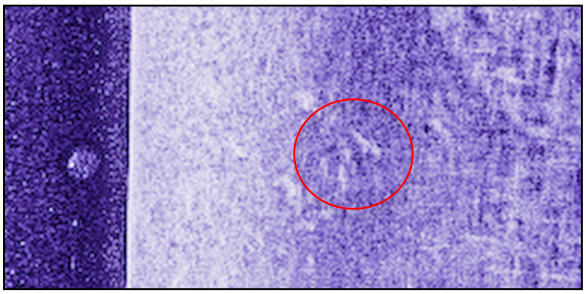
Above: A sonar image of Anomaly 514 (MHM).



Right: The Bent Boat Ladder (Kelly Nehowig).

Steel Machinery Part (Anomaly 542)

MHM volunteer Kelly Nehowig located Anomaly 542 while using his self-developed underwater navigation device NavDive. MHM did not recognize this artifact on the sonar footage recorded in the area in September 2011 where Anomaly 542 was located. Using NavDive, Kelly documented the artifact's GPS coordinates and this information allowed MHM to return to the site for further investigation. The object is a steel piece of machinery, currently unidentified, that exhibits rivet construction.



A sonar image of Anomaly 542 (MHM). MHM would not have recognized this object simply with sonar. Kelly Nehowig's NavDive system insured a return to the site for further investigation .



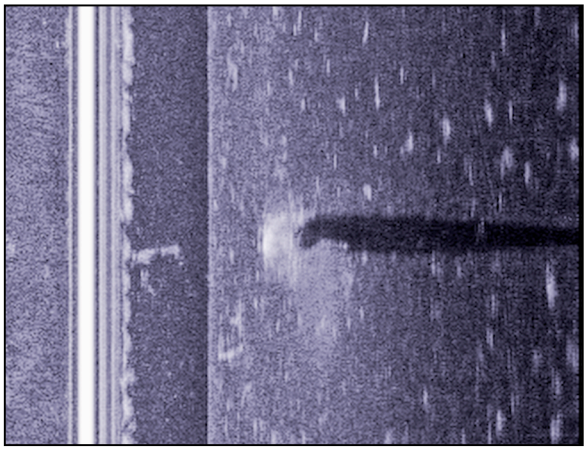
The Steel Machinery Part (Kelly Nehowig).

Burned Wreck (Anomaly 541)

On Saturday, August 1, 2015, a boat caught fire and sank in Crystal Bay, with no injuries. The people on the boat jumped into the water and were picked up by near-by boaters (CBS Minnesota). MHM located and recorded a sonar image of the wreck on August 5, with the intention of diving on the wreck to study the wrecking process. However, authorities raised the wreck before MHM could document it (Lt. Ken Vnuk, personal communication, 12 August 2015).



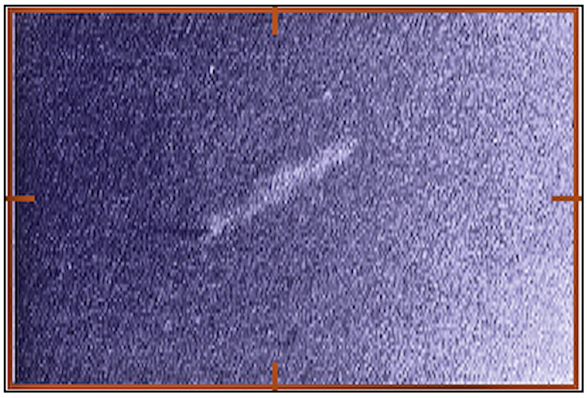
The burning boat on Crystal Bay (CBS Minnesota).



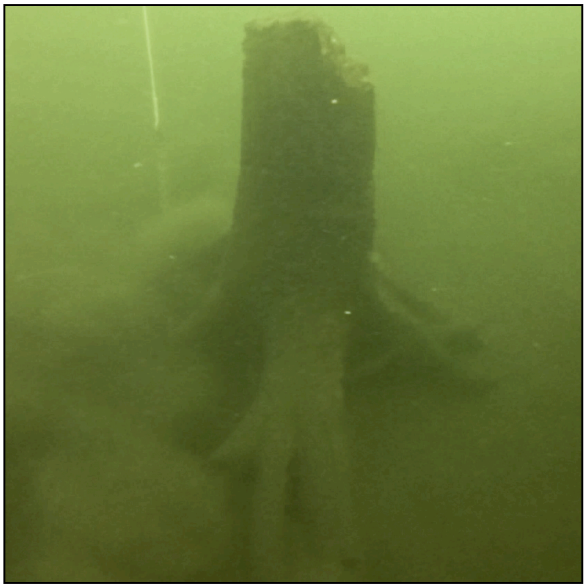
A sonar image of Anomaly 541, the Burned Wreck. the long acoustical shadow suggests the wreck was not sitting flat on the lake bottom, but was suspended in the water column (MHM).

Cut Tree Stump (Anomaly 13)

MHM recorded a sonar image of Anomaly 13 in November 2011. The object appeared to be small, but it did cast a significant acoustical shadow. In late-August 2015, MHM identified Anomaly 13 as a Cut Tree Stump. Like The Old Man of St. Albans Bay, even though the Cut Tree Stump is a left over from the cutting down of a tree, it has been modified by humans and is technically an artifact. The stump was either left on the ice or dumped from a barge into the middle of Browns Bay. Anomaly 13 is a cultural resource that is protected under the jurisdiction of the DNR.



Above: A sonar image of Anomaly 13 (MHM).



Right: The Cut Tree Stump (Kelly Nehowig).

Anomalies 42, 128, 423, 511

Sonar images of Anomalies 42, 128, 423, and 511 were recorded during the LMS-1 and LMS-2 Projects in 2011 and 2012. Their sonar signatures suggested they might be human-made objects because they had substantial acoustical shadows and their shape

suggest straight lines. After diving on these anomalies during the LMNA-4 Project, it has been determined that they are rocks.

Anomalies 127.4, 496, 501, 509

Sonar images of Anomalies 127.4, 496, 501, and 509 were recorded during the LMS-1 and LMS-2 Projects in 2011 and 2012. These three anomalies were identified during the LMNA-4 Project as logs or parts of unprocessed trees.

Anomalies 90.1, 127.1, 129, 146, 171, 184, 203, 247, 288, 291, 350, 359, 411, 414, 418, 455, 458, 463, 485, 490, 503, 519, 528, 529, 545

MHM recorded sonar images of Anomalies 90.1, 127.1, 129, 146, 171, 184, 203, 247, 288, 291, 350, 411, 414, 418, 455, 458, 463, 485, 490, 503, 519, 528, 529, and 545 during the LMS-1 and LMS-2 Projects. They were determined to be false targets during the LMNA-4 Project, the majority of them being either contours on the lake bottom that suggested human-made objects or vegetation that cast significant acoustical shadows.

Conclusion

The LMNA-4 Project produced significant and interesting results, particularly identifying 7 new wrecks on the bottom of Lake Minnetonka. The identification of the Crystal Bay Rowboat Wreck (21-HE-457), Maxwell Bay Rowboat Wreck (21-HE-469), and Wooden Motor Boat Wreck (Anomaly 467) are noteworthy because of their carvel construction, the first three small wooden wrecks located in Lake Minnetonka that were not clinker-built. The Correct Craft Utility Wreck (21-HE-467) as an archaeological site is an interesting example of a wooden inboard boat with no apparent reason for her sinking. She sank while in use and was not scuttled due to the presence of the key in the ignition. She may have been in a collision with no damage evident due to the great amount of silt built-up around the hull. To date, no specific newspaper report of an accident involving this type of watercraft sinking between July 1, 1959 and 1962 has been located. The Span America Nomad Runabout Wreck (Anomaly 126.1) represents a Minnesota-manufactured fiberglass boat from a somewhat short-lived boat company that only operated in our state for one year (Merriman and Olson 2013b, 47-50). Although stripped and scuttled, the signature hull form of Span America boats is seen in the wreck's design. The Larson Delta Sport Cruiser 7000 Wreck (Anomaly 464) is a complete example of its type, with all fittings and dials intact, and an out-fitted cuddy. Lastly, the existence of the Half Canoe Wreck is a bit of a challenge in terms of the number of unanswered questions she represents. Where is the other half? Did she pop her rivets while traveling on the lake? Was she scuttled? Is one of MHM's other Lake Minnetonka anomalies the other half of the wreck? These questions may be answered in the future.

The LMNA-4 Project also allowed for MHM to conduct condition assessments of the Wayzata Bay Wreck (21-HE-401), *Saucy Kate* Wreck (21-HE-420), *George/Excelsior* Wreck (21-HE-399), *Como* Wreck (21-HE-397), *Hopkins/Minnetonka* Wreck (21-HE-396), *Priscilla* Wreck (21-HE-404), *Hercules* Wreck (21-HE-398), and the St. Albans

Bay Wreck (21-HE-400). MHM had not dove on five of these wrecks until this project because they are well-known in the historical record and in archaeological terms, only a few questions required answering. Beyond the verification of surviving nautical attributes on the different wrecks, the discovery of zebra mussels on deeper wrecks below 35 feet of water was unexpected and discouraging. MHM is willing to assist State authorities is dealing with the zebra mussel problem in Lake Minnetonka once a plan of action has been developed.

Other maritime sites identified during the LMNA-4 Project, the Wooden Sailboat Mast or Boom (Anomaly 291.1), Metal Pontoons Sites (Anomalies 477, 478), Boat Canopy Frame Sites (Anomaly 110, Anomaly 269), Boat Ladders (Anomaly 62, Anomaly 514), and Buoy Anchors Site (Anomaly 185) represent parts of boats, accessories that are used on boats, and lake navigation aids. The Polaris Indy 500 Classic Snowmobile Site and Dodge Ram Laramie SLT Pickup Site represent winter activities on the lake, transportation across ice to get to activities like ice fishing. The miscellaneous submerged resources located during this project, the Metal Box (Anomaly 466), Metal Pole and Electrical Box (Anomaly 468), and Metal Pipe (Anomaly 121.1) are components of dock structures or carried on boats while on the lake, while the story behind the Small Metal Drum (Anomaly 220) remains unknown. The Rubble Pile (Anomaly 544) represents an interesting group of building materials discarded by a lake resident as useless. A future investigation of the near-by second rubble pile may include other objects that would allow a different interpretation. At this time, the Steel Machinery Part (Anomaly 542) is an unknown, just a large riveted piece of metal. In time, its identification and purpose may be ascertained. Even though "The Old Man of St. Albans Bay" (Anomaly 70) is a cut log and the Cut Tree Stump is just a cut stump, they are technically submerged cultural resource since the trees they were made from have been modified by human beings. The Old Man, as a probable pier or dock piling, is part of the lake's history that simply floats freely and upright on the bottom of the bay. Lastly, the Burned Wreck (Anomaly 541) shows us that boats still catch fire, that boats still sink on Lake Minnetonka, and that boats will sink in the future.

The 2015 Sediment Build-Up Study was a success. Sediment data collected in 2013-2014 from wrecks in different sections of Upper and Lower Lake Minnetonka will be augmented with information accrued during the LMNA-4 Project. The sediment amounts measured inside the hulls of the *George/Excelsior* Wreck, *Como* Wreck, *Hopkins/Minnetonka* Wreck, *Hercules* Wreck, and the Correct Craft Utility Wreck are particularly helpful for determining the sinking dates of resources based on sediment build-up rates due since the sinking dates of these wrecks are known.

The diversity of nautical, maritime, and underwater sites so far identified in Lake Minnetonka are tangible examples of the rich maritime history of the area. Through research, diving on wrecks and anomalies to collect pertinent data, and ensuring that the collected information is accessible by the public, MHM will continue to investigate Lake Minnetonka's submerged cultural resources into the future. MHM continually re-examines the recorded sonar footage from the LMS-1 and LMS-2 Projects, and spot re-scanning has occurred in different areas of the lake, using knowledge gained from the

comparison of anomalies that have proven to be wrecks or other submerged cultural resources in past projects. Several hundred more anomalies have been identified from this on-going re-study and to date. The results of the LMNA-4 Project summarized above is connected to all the work that came before and will come after its completion. It is clear that the types of sites that exist in Lake Minnetonka are diverse, archaeologically and historically significant, and worthy of great attention. To date, the watercraft located on the bottom of Lake Minnetonka represent nearly 1,000 years of Minnesota's maritime history and nautical archaeology. In the historic period, the known wrecks represented in the lake span 139 years of local maritime culture. The data collected during the LMNA-1, LMNA-2, LMNA-3, and LMNA-4 Projects have been utilized to create the Lake Minnetonka Multiple Property Documentation Form, a guide that will be used to nominate Lake Minnetonka's submerged cultural resources to the National Register of Historic Places.

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